An analysis of diversification by location in the South African property market.

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Abstract

The purpose of this dissertation is to investigate whether a property investor could diversify their portfolio by investing in the same property class and type throughout three different cities in South Africa. Furthermore, the study aimed to achieve this by providing an in-depth analysis of property cycle activity in South Africa and investigating how different South African cities react to the national property cycle. Cape Town, Durban and Johannesburg were chosen, as they are major cities in South Africa. The time frame used is the 2001 to 2009 property cycle with specific reference to office space. The timeframe does not cover the property cycle over an extended period where factors may be different from the ones concerned here. The outcome of the study will help to provide an understanding how the three different cities reacted to the national property cycle using variables such as but limited to gross rentals receivable, total return, income return and vacancies. The results of the study will help in making investment decisions, especially for investors who may want to diversify their portfolios across different cities within the same country.

The methodology of this dissertation will be based on a comparative analysis using mainly Investment Property Databank (2013) data subsequent to a literature review. The findings are based on Investment Property Databank (2013) statistical industry performance data. The conclusion will be drawn from the results.

The primary motivation for this research stems from investors' need for a greater understanding of diversification within the property cycle to improve investment decisions. The primary objective achieved was to contribute to the understanding of the predictability of the property cycle, which can assist in the decision making of a property investor looking to diversify by location in their property portfolio.

Whilst this finding was not the primary objective, this dissertation revealed that there are synchronicities between the Central Business District and decentralised office markets of the three cities of Cape Town, Durban and Johannesburg.

Declaration:

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Sciences in Construction Economics and Management at the University of Cape Town. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Signed by candidate

Signature Removed

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11 November 2016
Date

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Key Words

Basis Point	BPS' A unit that is equal to 1/100th of 1%, and is used to denote the change in a financial instrument.
Capitalisation Rate	It is the expected net operating income for year 1, assuming the entire building is let at open-market rentals, divided by the purchase/transaction price, normally expressed as a percentage. This calculation ignores VAT, transfer duty and income tax, and assumes a cash transaction (in contrast to a paper-based sale).
Discount Rate	The rate used to express an expected future cash stream in present-value terms. In most instances, the discount rate is equal to the hurdle rate. Mathematically, the hurdle rate of a property is the sum of its market capitalisation rate and the expected constant growth rate of its cash flow in perpetuity.
Gross Domestic Product	The World Bank (2013) "calculates the Gross Domestic Product by adding all of the gross value added by all the residents of a country in its economy, adding product taxes and minus any subsidies which are not included in the value of the products. A constant local currency is used as the basis for the annual percentage calculation of gross domestic product at market prices. The aggregates are then based on a constant of 2000 US Dollars."
Inflation	According to the World Bank (2013), "inflation is measured by the Consumer Price Index by showing the average change of a bag of goods and services to the average consumer in a country."

Market Rental	The most probable rental that a voluntary, informed and prudent lessee will pay a voluntary, informed and prudent lessor in a normal open-market (arms-length) transaction, when neither party is under any compulsion to rent or let, other than their normal desire to transact.
Prime Lending Rate	The prime lending (also known as the predominant rate) is the rate that is a benchmark for what private banks will lend money out to the public. This rate is of great importance, because it gives a benchmark in which funding for commercial developments will be financed (whether below or above the benchmark).
VAT	Value-added tax

Office Building Grades

Grade A	Generally not older than 10 years, unless renovated; prime location; high quality finishes; adequate on-site parking; air-conditioning. Commands a gross market rental as indicated in the accompanying table. Examples are: Surrey House (Johannesburg CBD); Libridge (Braamfontein); 540 Pretorius Street (Pretoria CBD); Old Mutual Centre (Durban CBD); Safmarine House (Cape Town CBD); Southern Life Plaza (Bloemfontein); Nedcor (Port Elizabeth, Greenacres); Metropolitan Life (East London).

Abbreviations

ANC	African National Congress
CBD	Central Business District
CPT	Cape Town
DBN	Durban
FIFA	Fédération Internationale de Football Association
GDP	Gross Domestic Product
IRR	Internal Rate of Return
JHB	Johannesburg
JSE	Johannesburg Securities Exchange South Africa
MPT	Modern Portfolio Theory
PLS	Property loan stock, also known as variable loan stock (VLS) (type of listed property fund).
PUT	Property unit trust (type of list property fund).
REITS	Real Estate Investment Trusts
RSA	Republic of South Africa
SAPOA	South African Property Owners Association
SARB	South African Reserve Bank
UCT	University of Cape Town
ZAR	South African Rand (Currency)

1. Definition of the Problem

1.1. Introduction

Property analysts, academics and developers have argued the significance of property cycles over the years. Dating back to 1927, in the United States and Europe, various pieces of research have been published by researchers such as Wheaton (1999), Burns and Mitchell (1946), Mueller and Laposa (1994), Kling and McCue (1987) regarding property and building cycles. This is a very important subject matter because property development involves substantial investment, and investing at the wrong time can have serious consequences. This includes the loss of investment returns that may even lead to the collapse of business. There are also the ripple effects in relation to goods, services and psychosocial impact. An increase in unemployment and poverty may result from miscalculations in property development. These are just a few examples and they hold true for property development the world over.

The Investment Property Databank (2013) shows that commercial property developers invest billions of rand into the South African economy every year through various property developments and investments. For the successful integration of new developments in the property stock, investors need to get the timing correct. Timing is a critical risk associated with portfolio formation and property related risk (Pyhrr, Roulac and Born 1999). Investors seek maximum return from their development through successful absorption of the space during the shortest time frame possible. For this to happen, various market forces will need to be at optimum levels, and most importantly the investor should enter the market at the correct time in the property cycle. If the development comes on the market too early, or too late, absorption rates will be low and return on investment will not be optimal. Hence the investor needs to enter the market at the appropriate time in the property cycle.

Property cycles are often analysed on a national scale. However, it is important to gain an understanding of how different cities react to the national property cycle. The growth of individual cities and economic output, impact the national growth of a country. The behaviour and growth of a certain area can determine

migration patterns to and from one area to another , spatial allocation, financial growth and property development in the said area and its surrounds. It is conventional wisdom that the growth of different cities may be independent of one another and determined by factors that are unique to each city. Major cities can grow at different rates and thereby be at different points in the property cycle at the same point in time. Knowledge of different cities' interactions with the national property cycle gives a clearer understanding of the property investment cycle in the South African context. This may have an impact on the ability to predict patterns of property cycles.

1.2. Research Problem

Property investors consistently take calculated risks when investing in new developments. Their aim is to achieve a balance between maximum return and minimum risk. Thus, it is crucial to try and minimise the risk as much as possible, in all facets of the development. One crucial matter is the timing of the development. It is imperative that investors understand both the building cycle across the country and that of the city in which the investment is made. If investors are able to accurately predict the property cycle across different cities, they will be in a better position to assess where and when it is best to develop. Over the years a vast amount of research has been conducted by Burns and Mitchell (1946), Forrester (1976), Kaiser (1997) and Wheaton (1999) covering property and building cycles. However, there is a lack of empirical research to which developers can turn to that provides detailed data and conclusions on how each city's property cycle in South Africa performs in relation to one another. Johannesburg is South Africa's largest, richest city, and the economic hub in the country (Sowetan 2012). It is a natural assumption that each city's building cycle would be different to one another. Topographically and economically each city is unique. Furthermore each city has different economic drivers that affect its investment patterns.

This study, therefore aims to investigate whether a property investor could diversify their portfolio by investing in the same property class and type throughout three different cities in South Africa. Furthermore, the study aims

to achieve this by providing an in-depth analysis of property cycle activity in South Africa and investigating how different South African cities react to the national property cycle. The knowledge gained will aid in the effectiveness of investor decision making. Property investors are consistently looking for information that will help them make sound investment decisions. The findings are relevant to investors, including those looking for different ways to diversify their portfolios.

Subsequent to the preliminary literary research, the following hypothesis was put forth:

The property cycle in South Africa is related, but also varies amongst major cities..

The hypothesis was tested through answering the following research questions or propositions:

Research Question 1:

Is there a relationship between the property investment cycles of Cape Town, Durban, Johannesburg and the national property cycle?

Research Question 2:

Is there a recognisable pattern between the property investment cycles of these cities?

Research Question 3:

Is there any benefit to diversification by location within the South African property market?

The methodology selected for this study was segmented into three phases. Firstly an initial comparative study was used to look at the historical data from

the Investment Property Databank (2013) presented in a linear manner to compare the performance of the chosen property sectors in each of the three cities. Subsequent to the comparative analysis, correlation matrices were built and analysed to explore diversification benefits. The correlation matrices were then used as the basis for the presentation of efficient frontiers of portfolio combinations to analyse the return to risk relationship between various different combinations of physical property investments within the three cities. Lastly, a volatility assessment was conducted by assessing risk and average returns of portfolio combinations while comparing them to an investors choices of investing solely in one market and equally across all of the chosen markets within the three cities.

1.3. Research Motivation

The understanding of property investment cycles is of great importance to all stakeholders in the property industry. The motivation for this research is to gain a deeper understanding of whether there is an existing relationship between property cycles of three different cities in South Africa. Property investors are consistently looking for ways to increase their return on investment, while lowering their risk. Having a greater understanding of the nature of cyclic behaviour can greatly assist in the facilitation of solutions to those two needs.

Various studies have been published including Mitchell (1927), Wheaton (1987), Grebler and Burns (1982), Kling and McCue (1987), Pyhrr, Roulac and Born (1999) however the bulk of those studies were completed in European countries or the United States of America. While this study may be similar to other works published by American and European authors, the data and variables used are from South Africa, increasing its relevance to local property industry and academics.

The study intends to determine a link amongst property cycles of major cities in South Africa and examine behavioural patterns that can be followed to predict how each city reacts to the national property cycle. The literature review covers various relevant frameworks and studies that have been published over the years.

According to Ramabodu, Kotze and Verster (2007), retail and commercial property were seen as future lucrative investments in South Africa. Hence, the need for further research and understanding of the South African property investment cycle is of great value to the property industry, and country.

1.4. Limits of the Study

This study only covers three South African cities, Cape Town, Durban and Johannesburg. The study focuses on the property investment cycle, of these three cities. The scope of this study is limited to the office sector within the three cities. The three cities have been selected because they are large cities, with different topography, are thriving economic hubs and spatially there is a great distance amongst them.

While the focus is limited to the office sector, a wealth of information can be analysed, as growth or a decline in economic activity will also be presented. The focus of the study is limited to development activity through the years of 2001 to 2009. It was also important to select a period that reflects the current nature of South Africa. In pre-1994 South Africa was characterised by political strife that came with sanctions and disinvestment. Thus, it was not an environment conducive to investment. The democratic dispensation of post 1994 ushered in a better climate for investment. As local and foreign investment grew over the years, South Africa experienced a growth in the business sector, facilitating a prime environment for office property development. Furthermore, the period 2001 to 2009 is of particular interest because of the economic growth, decline and global credit crisis which took place within those years. Davies and Siew (2009) reported that 45% of the world's wealth was destroyed during the period of October 2007 to March 2009.

1.5. Methods of Selecting Data

The data and theories used for the analysis are credible to ensure this study retains integrity. Hence, data sources were selected carefully. The bulk of the industry data used in this study come from Rode & Associates, the Investment Property Databank (2013) (IPD) and the South African Property Owners Association (SAPOA) who are reliable sources in the field. The literature reviewed covers published journals such as but not limited to the U.S. Journal of the American Real Estate and Urban Economics Association, the Journal of Monetary Economics and the Journal of Business Economic Statistics. The work of authorities in the field relied upon include that of Burns and Mitchell (1946), Kling and McCue (1987), Mueller and Laposa (1994) and Wheaton (1999). Papers and presentations from conferences or university research conducted by amongst others, the University of Melbourne's Department of Economics and the Melbourne Institute are deemed credible, hence their use. Data from the South African Reserve Bank, The World Bank and International Monetary Fund is used as these sources are reliable.

1.6. Conclusion

A hypothesis is presented, and will be tested through the answering of several research questions. Subsequent to a literature review, a comparative analysis of the national office property market is conducted by initially identifying turning points using Fanning's (2007) Four Cycle Model. The turning points are used to ascertain the different phases of the property cycle over the nine years. Parameters for the study are set out which include timeframes, locations and property markets to be used in the study. Comparative variables are used as essential indicators of performance across the different markets of the three cities. The performance of each market within each city is presented in tandem with the office market national benchmark performance to indemnify relationships and form the basis of comparison of the markets. The results of the comparative analysis are then used to test the hypothesis put forth through answering the research questions.

The focus of the study is to ascertain the reaction of property investment cycles

of different cities in South Africa to the national property cycle. The results indicate a pattern of action that is synchronised amongst the cities and linked to the national property development behaviour.

2. Theory and Literature Review

2.1. Introduction

In order to answer the research question adequately, a literature review was conducted to establish a foundation for the study. This includes assessing whether similar studies have been done before and identifying relevant and applicable theories and methodologies. The literature review covered cycle theory, property cycle theory and business cycle theory.

2.2. Cycle Theory

Knowledge of cyclical events can be very useful in understanding the timing of an industry, and how that industry functions. The understanding of cycles has been an important element for human survival since the dawn of time. According to Miller (1997) every day, humans experience cycles in different aspects of their lives for instance, time of the day, day of the week or month, month of the year or seasons. On the surface, this can seem trivial. However, these core cycles are of great importance to the very survival of humankind. For instance, agriculture is based on seasons, and since agriculture is the basis of food creation, it is important for the farmer to understand when is the best time of the year to prepare the soil, plant crops and harvest. Some cycles happen more frequently than others. The cycle of sunrise and sunset occurs every single day, albeit not always at the exact same time. Other cycles have a longer frequency time such as earthquakes and volcanoes, which occur every few years (Miller 1997) and with dire consequences. Naturally the exact time and date are much more complicated to determine, as the frequency of these cycles can be affected by unforeseen circumstances. As with the examples just mentioned property development is also subject to cycles.

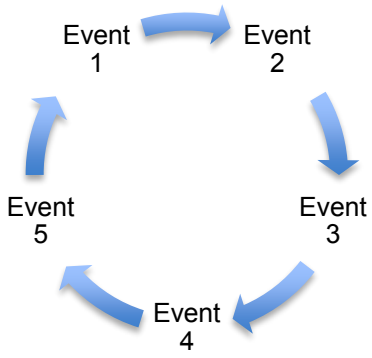
When looking at cycles in the simple micro context of property development, it would be paramount for the developer to know when the best time of the year to construct is. For instance, constructing a structure outside during a hurricane season is not advisable. When looking from a macroeconomic viewpoint of property cycles, development patterns, costs and sales or rental prices are

affected by cycles. Property development demands major financial resource input and due to the protracted nature of construction and capital raising, property stock is generally added at a relatively slow rate. Therefore, it is pivotal that developers comprehend property cycles as much as possible. To have an understanding of property cycles, it is imperative to define the concept "cycle". According to the Cambridge Dictionary (Cambridge 1999), the definition of a cycle is:

1. *A group of events that happen in a particular order, one following the other and are often repeated.*

The Oxford Dictionary (Oxford 2014) defines a "cycle" as:

1. *A series of events that are regularly repeated in the same order.*



Source: Oxford 2014

Figure 1: A Cycle

While Cambridge (1999) and Oxford (2014) provide definitions of a cycle, Harding and Pagan (2005) proposed three methods to identify a cycle:

1. Models assuming sinusoidal[1] periodicity:

   This model imitates cyclical behaviour of an economy by making use of combining sine and cosine curves.

[1] of, relating to, shaped like, or varying according to a sine curve or sine wave <*sinusoidal* motion> <*sinusoidal* alternating current> <*sinusoidal* grooves> (Merriam-Webster 2014)

2. Cycle identification by reference to turning points (i.e. peaks and troughs):

   As with much of cycle research, Harding and Pagan (2005) focus on peaks and troughs, which create “turning points” in cycles. These points are the moment in time, when the driving factors change the course of direction of the economy or pattern. The earlier research work of Burns and Mitchell (1946), shows that cycles can be broken down into segments where expansion and contraction occurs. A visual example of contractions and expansion segments will be shown as the Four Cycle model in section 2.4.2 of the research. In the segments of expansion peaks occur, and in the contraction segments troughs occur. The peaks are at the height of the cycle when the driving forces have pushed the property cycle as far as it can go (highest absorption rates, highest rentals, lowest vacancies, most development activity, etc.), and suddenly the market cannot sustain the growth any longer, which leads to a turning point in which the cycle begins to decline. The troughs in a cycle are reached after a swift decline in the cycle during the contraction phase and the cycle hits its lowest point (lowest rents, highest vacancies, least development activity etc.). The cycle then starts all over again, and goes into an expanding segment where growth occurs until it reaches its peak.

3. Methods based on output cycles as “serially correlated deviations of output from trend” (Blinder and Fischer 1981:227)

   Economists favoured this method because at the time, they were trying to find solutions to their problems with macro econometric modelling. However, at the time, according to Blanchard & Fisher (1989) economists and analysts believed that “turning points” were not a solid theory as there was a lack of statistical basis, which was sufficient enough to build concrete models on.

A solution to economists' problems with macro econometric modelling was their models required assumptions of linear stochastic data generating processes which could not be found in "turning points". Harding and Pagan (2001, 2002 and 2005) however, continued to research and publish work on "turning points". Their work later created a statistical basis in short-term economic activity for "turning points" which was not there before.

Today the "turning point" cycle is globally recognised as a legitimate way of analysing cycles. Importantly, locally, "turning points" cycle theory is still in practice at the South African Reserve Bank (SARB), which uses it while analysing the South African business cycle (Mohr 2000:69; Venter 2005: 61). The SARB method of calculation takes into account various factors and makes its calculations based on more than one economic series of events. This allows for its calculations to be as accurate as possible when completing a turning point analysis. This method of calculation has proven to be popular amongst other central banks around the world (Harding Pagan 2001; 2002; 2005).

According to Venter (2005) historical and current diffusion indices are used as the basis of measurement of peaks, troughs, recessions and booms. The historical diffusion index is defined as "a measure of the dispersion of the changes in a number of economic time series in a specific period, mostly a calendar month." (Venter 2005: 63) A timeframe is selected in which peaks and troughs are then determined. The timeframe is then measured by assessing the increases or decreases for each period after the trough or peak respectively. The historical diffusion index value is then determined by the number of increasing time series within the set timeframe (e.g. the selected month) within the total number of timeframes. This outcome is given as a percentage value. When the outcome is over 50, it shows that more than 50% of the series within the set timeframe (month) are increasing, which is an indicator of the economy being in an upward phase. The exact opposite applies for when the outcome is below 50, as it shows that more than 50% of the series within the set timeframe (month) are decreasing, which is an indicator of the economy being in a downward phase. Analysts consider every time the index passes through the 50% mark when using the historical diffusion index theory,

as a “turning point”. The historical diffusion index is a very helpful tool when analysing “turning points” in the economy.

The current diffusion index is also used for determining “turning points” in an economy, however it works differently from the historical diffusion index. The current diffusion index which uses month-to-month changes in each time series (which is the deviation of the current diffusion index) is then measured against long-term trends. The results provide an indicator for cyclic movement in the economy. Harding and Pagan (2005) also advocated the usage of “turning points” which is still widely used today.

Whilst parametric techniques have become popular around the world in “turning point” analyses they may be very complex. Parametric models are complex models that are used for forecasting. They have levels of complexity that result in limitations. The models can increase in complexity when doing an analysis where the researcher attempts to limit the study goals. These limitations may come in the form of limiting the dating and describing cycles. These levels of complexity can make the model unattractive to researchers because parametric models, unlike calculus are not constrained by a set of rules. Hence, Burns and Mitchell (1946) created a method that is non-parametric.

2.3. Property Cycle Theory

For the purpose of this study, William Wheaton (1999) described a property cycle by saying

"…a more restrictive definition of a real estate cycle involves repeated oscillations of a market, as it continually overshoots and then under shoots its own steady state…real estate cycles are defined as some degree of instability in the market whereby a single economic shock leads the market to oscillate around its steady state for some number of iterations" (Wheaton, 1999, pp. 217- 8).

Property Cycle knowledge is of great importance because cycles have a significant impact on the risk, return on investment and values of property. Pyhrr, Roulac and Born (1999) have shown the importance of the understanding of property cycles as they outlined in their study titled Real Estate Cycles and their Strategic Implications for Investors and Portfolio Managers in the Global Economy. The study investigates what an investor takes in his/her strategy, when entering the property investment market. An important action is to create an investment strategy for direct investment by assessing the markets, submarkets, property types and locations based on past performance; and forecasted performance of property variables while taking a market position (expansion, contraction, trough or peak) into consideration.

Earlier research conducted by Grebler and Burns (1982), Kling and McCue (1987) and Wheaton (1987), were centered on the basic cyclical phases of overdevelopment in the commercial office space. They postulated that these basic cyclical properties were attributed to long delays in the capital raising necessary for large developments, and also due to the long lifespan that a development has. Forrester (1976) also agrees with this argument and believes that fifty years is ample time to develop troughs of deferred investment and peaks of excess capacity.

For property cycle research to have value, there must be a vast amount of data used in a research study. Hence most property cycle research looks at cycles from 7-10 years. This provides sufficient data for relatively accurate cycle forecasting, allowing developers to try and receive maximum value in their long-

term investments. Barras (2009) conducted a study which focused on the office market cycles of three cities in the United States and concluded that on average property cycles tend to span for approximately 10 years. Other studies by Mueller and Laposa (1994) that are based on property cycles are defined by fluctuations in vacancies. These vacancies fluctuate over or under an equilibrium based on the basic economic principle of supply and demand. The fluctuations are then analysed in depth to understand the drivers of supply, new construction and absorption of space. Mueller and Laposa (1995) carried out a study analysing thirty-one metropolitan office markets during the years of 1967-1993. They drew the conclusion that out the four groups of varying cycles, 7.25 to 8 years was the cycle length that was most common.

Hoyt (1933) investigated one hundred years of property activity (rent, land values, etc.) in Chicago and began to raise awareness of the *18-year cycle*. The 18-year cycle gained attention subsequent to the 1971 Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel (also known as the Nobel Prize in Economics). The prize was awarded to Simon Kuznets, who is the founder of the 18-year cycle. He published his work in 1930 detailing building cycles in the United States based on his empirical research. Wenzlick (1972) later reaffirmed the *18-year cycle* in his research titled the Real Estate Analyst. Kilian and Snyman (1984) showed the existence of Kuznets' cycles in the South African private housing market. Their study shows a correlation between migration patterns and housing investments in South Africa during the periods of the 1950's to early 2000's.

Subsequent to the post-war boom, property analysts began to focus less on the *18-year cycle*. Kaiser (1997) believes that longer cycles such as Down's (1993) 30-year, 50-year, 60-year, several 100-year cycles and Rabinowitz's (1980) 18.3-year cycle are more appropriate for the accurate measurement of property cycle behaviour. Pyhrr and Roulac (1996) conducted a study, which investigated fifteen different types of cycles (including but are not limited to technology, social change, construction, business and inflation) that must be analysed during the process of property cycle forecasting. The study showed that cycle research should be focused around seven subject areas: Theory;

Empirical Research; Market Information and Data, Forecast Techniques; Project and Portfolio Modeling; Strategic Frameworks; and International/global Cycles. To this very day there is not a uniform timeframe measurement for a property cycle. Brown (1984), Witten (1987) and Mueller (2002) believed the length of time needed to gain a full understanding of a property cycle needs to be increased from Wheaton's (1987) concept of a ten to twelve year cycle (specifically for the office market). In South Africa, according to De Vynck (2003) the average property cycle lasts for 17 years from peak to peak. To this very day there is not a uniform timeframe measurement for a property cycle.

Over the years, there has been property cycle research that has been conducted with a macroeconomic view and a microeconomic view. A macroeconomic view primarily investigates a theory with a wide scope of focus often looking at international, national or sometimes regional level. An example would be looking at office rentals or business cycles of an entire country. A microeconomic view is significantly more focused on targeting specific areas, markets or submarkets. While this section will present the theory of macroeconomic property cycles, the greater focus of the quantitative study will be from a microeconomic viewpoint.

During the 1980's, a few notable research studies from a microeconomic viewpoint were published. Hekman (1985) conducted a study using fourteen cities investigating office markets. He used the time period of 1979 to 1983 aggregating office construction data to formulate a conclusion that office construction is cyclical. Corgel and Gay (1987) conducted a study using the thirty largest metropolitan areas to investigate diversification by region. In the same year, Witten (1987) published his work providing light on the effects of economic cycles on the timing of property investment in regional and metropolitan areas. A year later, Voith and Crone (1988) completed their work investigating vacancy rates in the American office market of seventeen metropolitan areas using the periods of June 1980 to June 1987. They found that there were cyclical characteristics that were in the vacancy performance over the set time frame.

Clapp (1993) conducted a study from a microeconomic viewpoint exploring office markets across the United States of America. His case study was based on cyclic actions of economic factors and their relationships with the variables in office markets of four northeastern metropolitan areas against the entire country. The study found that in the 1990's during the periods of economic growth, the four Metropolitan Statistical Areas used in the study were highly correlated with the national office market, which meant that properties in those areas performed similarly to the national office market. As mentioned earlier, Mueller and Laposa (1994) completed a study that was based on the fluctuations of vacancies using fifty-two office markets across America, to investigate cyclical activity. A few years later, Shilton (1998) published his work investigating the relationship between an economic base of a city and its relationship with office employment. The study was used as a way to gain an understanding of the cyclic nature of office employment demands in metropolitan areas. The study used the timeframe of 1975 to 1994, and found that the office employment cycle shifted to a seven year cycle. A year later, Gordon, Mosbaugh and Canter (1996) published their work on the cyclic behaviour of thirty one office markets in metropolitan areas in the United States of America during the period between 1978 and 1995. The study took vacancy rates as a basis and found that office vacancy rates are subject to change at different times in the property cycle by reacting to various factors. The study looked at being able to quantify the movement and change over different times in the property cycle to assess risk. The authors concluded that depending on the period in the property cycle, vacancies will be affected and that the vacancy risk determinants will depend on where in the property cycle the market currently is. Wheaton, Torto and Evans (1997) also published their work, which investigated the London office market during the years 1970-1995. Their study forecasted the London office market behaviour by estimating calculations using equations that would calculate movement in net rentals, absorption rates and employment. The study found that during the 1980's the office market building boom was due to the growth in employment.

Property developments are generally extremely durable, and last for decades or even centuries with befitting maintenance. Thus, property is often viewed in

a stock-flow model. Wheaton (1987) indicated that the stock flow model in its most basic form (which doesn't take vacancies into account) operates under the assumption that the market in each period clears. The stock-flow model is based on the concept that rental prices will adjust until the demand for stock is fulfilled. Subsequently, more stock will come onto the market through development. Property stock is added at a relatively slow rate due to the nature of lengthy development periods, and the pace at which new capital is available. Economists, financiers and analysts, value making investment decisions based on future prices of stock when completed. Wheaton's (1987) theory was later strengthened by Mueller. Mueller (1995) looked at property cycles by examining supply and demand without considering other external factors, and in the capital flows into property (new developments and existing stock) in the financial cycle. His theory helped give clarity on the lag between market movements and property prices.

An understanding of property cycles is also of immense importance when assessing valuations. This was shown when Born and Pyhrr (1994) published a study that was able to demonstrate that economic cycles impact real estate returns. Their study was based on using a cycle valuation model to study the relationship between economic cycle, property cycles, price cycles, life cycles and equilibrium price cycles. The results of the study suggest that valuation professionals should use cash flow models that also include cycle impacts in their valuation models to achieve the most accurate and realistic valuations.

Property cycles are often segmented into four different categories, namely, Recovery, Expansion, Oversupply and Recession, which will be explained in greater detail in section 2.4.2. According to Mueller and Pevnev (1997), property cycles tend to have a combination of over-/under-supply and more or less demand than needed for the current stock.

While early property analysts and economists have documented the basic property cyclical characteristics of overbuilding. Modern property cycle theory has created a clearer picture of how property cycles function and what influences them. According to DiPasuqale's (1996) model, property cycles

were influenced by the user market, the development market and the investment market. The User Market focuses on the supply and demand of the property stock currently on the market. Vacancy rates and market rentals influence the Financial Market. In the Financial Market, interest rates influence capitalisation rates. Market rentals are capitalised by investors who are looking at long-term future growth of capital and rentals. In the Development Market developers seek investment opportunities. They make their investment decisions by comparing property values from the User Market with development costs in Financial Market.

There are times when property markets reach equilibrium. The equilibrium point is extremely difficult to accurately ascertain. However, according to Mueller and Pevnev (1997), the long-term vacancy rate calculated over numerous successive property cycles is the best unit of measurement for calculating the equilibrium point of supply and demand. Above and below the equilibrium point, the relationships between supply and demand differ drastically.

Some researchers also refute the importance of property cycles. Authors and analysts over the decades have attempted to build cases to completely ignore property cycles all together. According to Pyhrr, Born, Robinson and Lucas (1996), historically various valuation experts have ignored the importance of property cycles. Pyhrr, Roulac and Born (1999) outlined the Reasons Why Real Estate Cycles Are Not Relevant or Can Be Ignored as follows:

1. *"Little academic interest in cycles: Not many academics are interested in conducting research on real estate cycles; therefore cycles must not be very relevant.*
2. *Financial theory does not address cycles: Modern financial and portfolio theory does not explicitly address cycles; therefore, cycles must not be very important.*
3. *Cycles cannot be measured: If there is such a thing as a cycle, one cannot measure it, or determine where one is in the cycle, or forecast where the cycle is going. Statistical research cannot validate the presence of cycles.*
4. *Economic forces are random: The economic forces that are perceived to create or represent cycles are random in nature, thus cannot be forecast or modelled.*

5. *Real estate markets are efficient: Therefore, knowledge about cycles cannot be used to increase the returns of a portfolio (or reduce risk), if the portfolio is property diversified to begin with.*
6. *Diversification eliminates cycle effects: With a large portfolio, a manager can diversify away the effects of cycles through good property type and geographic diversification; therefore a portfolio manager can largely ignore them.*
7. *Long-hold approach eliminates cycle effects: Many investors, especially institutions such as pension funds and Life Insurance companies are patient investors that ignore short-term market cycles.*
8. *Cycle strategy gains are offset by the costs: If there are increasing returns from "playing the cycle," any potential extra gains will be eliminated because of the additional information and transaction costs and risks associated with turning over properties in the portfolio.*
9. *Lack of evidence about economic cycle impacts: Little is known about the effects of economic cycles of cash flow variables- rents, vacancy rates, operating and capital expenses, capitalization rates.*
10. *Cycle model specification is difficult: Accurate specification of analytical models that explicitly consider cycles and their impact on investment returns/risks is difficult or impossible.*
11. *Inadequate data: Adequate and accurate market and financial data needed for inputs into a cycle model are not available.*
12. *Lack of investor interest in cycles: There is no evidence that investors use cycle forecasts in their investment decision-making or strategies.*
13. *Simplicity and lower cost trend analysis: Traditional DCF models that input constant rent and expense increases over the analysis period are easy to use, inexpensive and have become the market standard among individuals and institutions.*
14. *Tradition: Since cycles have not been considered a relevant decision variable in the past, they can be ignored in the future; traditional investors are slow to change their perception of the investment environment and cling to traditional investment evaluation techniques.*
15. *Vested employment interests result in conventional wisdom strategies: Most portfolio managers have vested employment interests and justify their positions by employing the safe, acceptable "prudent-man" strategy. They do what their peers in the industry do or they "go with the flow" and "conventional wisdom," which largely ignores cycles strategies. Mavericks and contrarians are not generally acceptable in bureaucratic institutional environments.*
16. *No crystal ball: Most portfolio models are based on historical data inputs. In contrast, cycle decision models require the analyst to input forecast data. This is difficult since (sic) the real estate industry has not developed good forecasting and prediction models. Further, as one manager has observed, "If you live by the crystal ball, you will die by (sic) eating a lot of broken glass." Forecasting is a high-risk business. Most investors and portfolio managers are risk adverse and seek to minimize the probability of being wrong." (Pyhrr, Roulac and Born,1999: p.11)*

While there may have been believers that property cycle theory is of no

significance, there is an abundance of empirical data that has been presented that states otherwise.

2.3.1. Property Cycle Clock

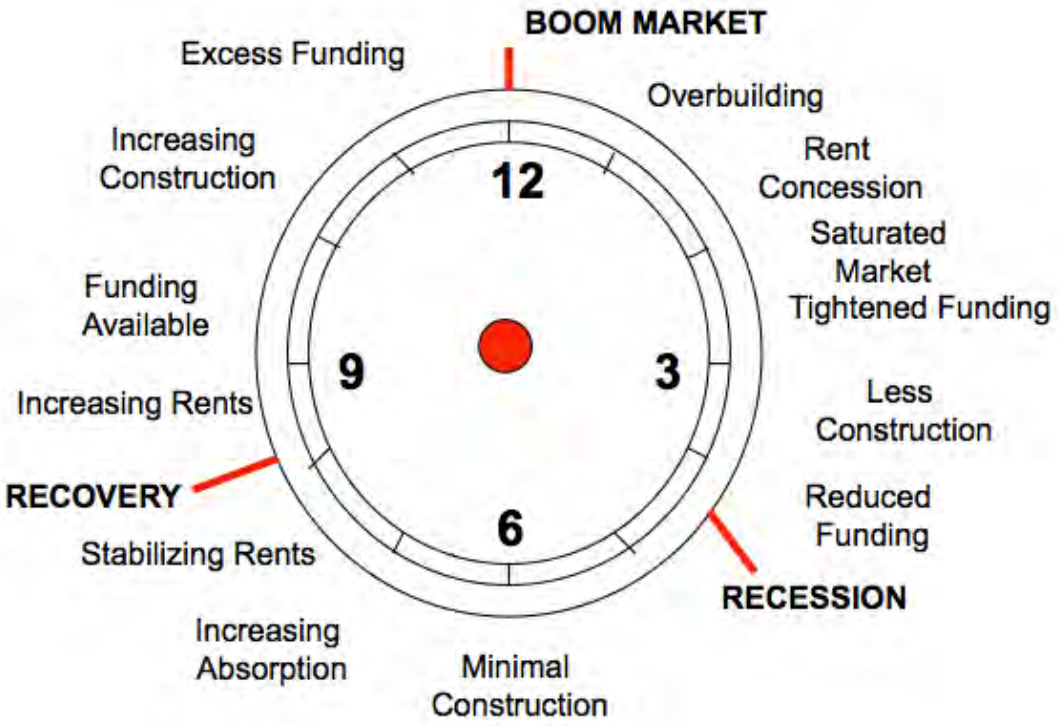


Figure 2: Property Cycle Clock

Source: Viruly Consulting 2011

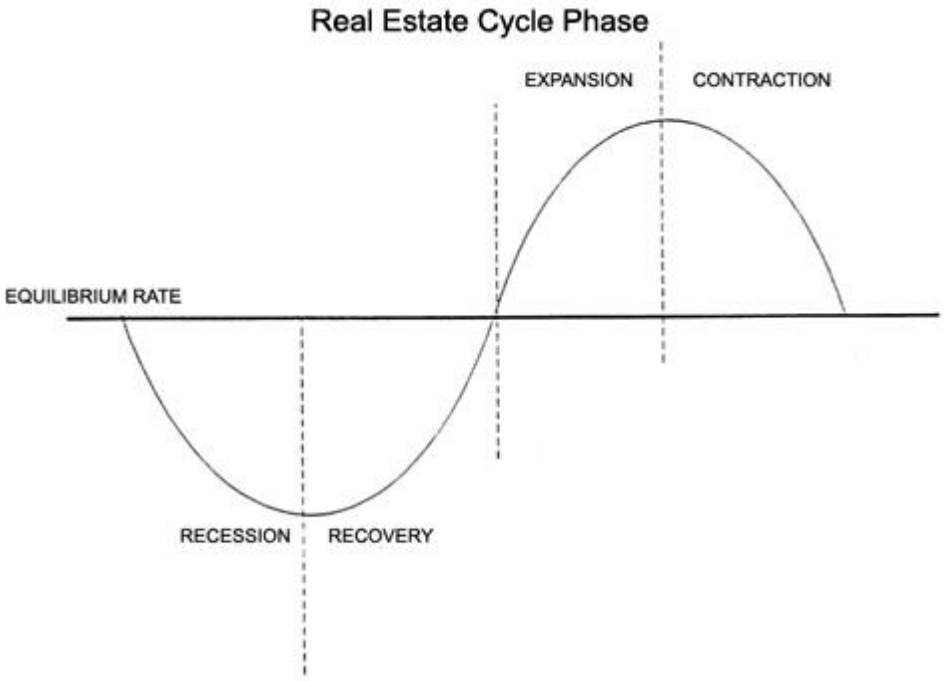
An acute understanding of property cycles is not only helpful to buyers, renters, sellers and developers, it's also important to the economy as property cycles and business cycles are often linked. Property cycles run longer than most product cycles. This is due to the durability of constructed property and there are two characteristics, which explain its length (Wheaton 1999). The time frame from initial conceptualisation to a complete building or development is very long, and naturally buildings or developments have a longer lifespan than the average consumer good.

According to Lottering (2010) property developers will often attempt to enter the market deep into the upswing, with the intention of filling up the demand needed by the public. Due to demand being high, prices will be high, vacancies will be low, and lenders will be interested in financing development. The crucial element in this cycle is timing. If the developer enters the market slightly later in the upswing closer to the peak, the development will increase in risk

(Lottering 2010). The nature of the risk is rooted in what was previously mentioned, namely, the length of time from conceptualisation to a finished development. Thus, if a developer enters the market too late, the building will be faced with high vacancy rates and loss of income. The determination of the optimal time to enter the market as a developer is not an exact science, as markets are never stagnant, and there are many variables that come into play. Supply and demand are not only directly influenced by the property cycle but are also heavily affected by economic factors (Wheaton 1987). The market itself is unique as it varies not only from what province, or city, but also all the way down to what area, suburb, or even a road. Opportunities can be found in various manners, depending on the developer's appetite for risk and investment timeframe. Therefore a thorough understanding of an area's cycle is of great importance as on a microeconomic level, each area can have its own cycle, tied to the cities property cycle, and the latter tied to the nation's property cycle and development trends.

2.3.2. Four Phases/Cycle Models

Research shows that property cycles can be analysed by segmenting period's different phases or time frames. Mueller and Laposa (1994) suggest property cycles should be analysed in four phases. Their work was later supported by Mueller and Pevnev (1997). Both studies were congruent on this specific topic of how property cycles are presented.



Source: Mueller and Laposa (1994)

Figure 3: Real Estate Cycle Phase

The four phases in this model are Recession, Recovery, Expansion and Contraction. The recession and contraction phases generally characterised by increasing vacancy rates, low or declining absorption rates and declining gross rent receivables. On the other hand, the Recovery and Expansion phases are often characterised by increasing gross rentals receivable, increasing absorption rates, increased development activity and declining vacancy rates. This method is one of the simplest ways to look at a property cycle, and it was supported years later by Fanning (2007), who demonstrated this through his Four Cycle Model, which is presented below:

2.3.2.1. Recovery

During the Recovery period, vacancy rates coupled with absorption rates are declining. Rental growth remains low throughout this period, construction and development are reaching or reached their trough. Due to the lack of development, absorption rates begin to level, and even begin to increase. As mentioned earlier, that property cycles are often closely linked with business cycles, thus with a property cycle being in Recovery, employment rates are

often lower than desired. Lower employments rates have a negative effect on growth and absorption rates in the property sector.

2.3.2.2. Expansion

In the expansion phase, employment rates begin to normalise and even grow. With employment rate growth, an increase in the demand for property (industrial and commercial and subsequently residential) can be seen. The increase in demand has a positive effect on the construction industry and absorption rates, as the current property stock is absorbed rapidly, and development of new property commences.

2.3.2.3. Oversupply

Development in this phase is at an all-time high. Financial instruments for lending are easily accessible, as financial institutions have recently seen growth and successful developments. Demand has also peaked, thus property prices and rentals are high. Prices can rise astronomically, pricing many buyers out of the market. Subsequently, demand begins to decrease, often while the developers are still bringing new developments on the market. While the cycle is turning, the business cycle is also turning, thus a decline in employment rates can be seen.

2.3.2.4. Recession

During the recession phase, a continuation of certain elements of the Oversupply market continues. Employment rates continue to spiral downward along with absorption rates and occupancy rates. At this point, the property bubble would have burst, causing a massive decline in prices. The decline in prices and demand negatively affect the construction and development market, as this market quickly grinds to a halt.

Both, the Four Stage Model and Four Cycle Model are extremely similar, and share the same characteristics. Assessing property cycles in four phases, can allow for the foundation of the investment strategy of a portfolio manager. From

a portfolio manager's perspective, the "upswing" is characterised by the upward trend that can be seen in the Recovery and Expansion phase of Figure 3. The "downswing" is characterised by downward trend shown in the Contraction and Recession phases shown in Figure 3. Depending on the investment strategy of the investor or portfolio manager, one can enter the market on the "upswing" or "downswing" and still see favourable returns.

2.3.3. The Stock Flow Model

Wheaton (1999) created a model to define the property cycled titled, the Stock Flow Model. He believed that property could be segmented into different "stocks" which could be analysed. This model highlights the importance of demand in the property market. This demand would relate to the business cycle and economic status of a market through employment rates and gross domestic product (GDP). Wheaton's (1999) theory is that an increase in demand, would lead to an increase in GDP and, employment rates, which would subsequently lead to an increase in development and prices of current property stock. Thus the new development would meet the demand, and would temporarily stabilise the market. However, this is a short-term fix. As development continues, demand will taper off, and oversupply will occur.

2.4 Property Risk

Property development is a very capital-intensive industry, which is also filled with risk. There is risk at every step along the way of investing in a development. The risk compounds as the size of the investment or number of investments increases. Risk in property is one of the major forces that developers, financiers and even governments want to lower to an absolute minimum. Developers with a strong understanding of the property cycle and its movements can significantly mitigate their risk. Thus, it's important for developers to understand how each cycle functions, in relation to each other and in relation to the associated risks.

According to and Brueggeman & Fisher (2005) there are 7 different types of development risk:

1. *Financial Risk:* The use of financial leverage magnifies business risk, and with the sheer capital intensity of mixed-use developments, financial leverage will be required. Managing the financial leverage (including re-financing if need be) of the development will be crucial to its success. This will include locking in interest rates if possible, because if interest rates change during the development period, the rate of return will decrease.
2. *Liquidity Risk*: This risk relates to the lack of continuous market between buyers and sellers, making it difficult to liquidate. When a development is harder to liquidate, the greater the risk of a price drop because it takes a longer than expected period find a buyer for the transaction.
3. *Business Risk:* This risk comes to effect when there's a loss of income due to fluctuations in economic activity, which then affects the income that would be generated from the property. In South Africa, this is extremely crucial as electricity and petrol costs can drive construction costs up, at any point during the development period.
4. *Inflation Risk*: Unexpected inflation will have a negative impact on a development, as the real rate of return will be reduced, therefore the value of the investment will decrease as well.
5. *Management Risk:* The risk based on the management company's ability to adapt management tactics to market conditions.
6. *Legislative Risk:* The risk that regulations or legislation can be put in place during the development phase or lifespan of the development negatively affecting the value of the development.
7. *Environmental Risk:* The risk of a development existing in a hazardous or un-environmentally friendly area. An environmental impact analysis should be done before attempting to develop any new mixed-use development to ensure that the municipality and the City will approve the development.

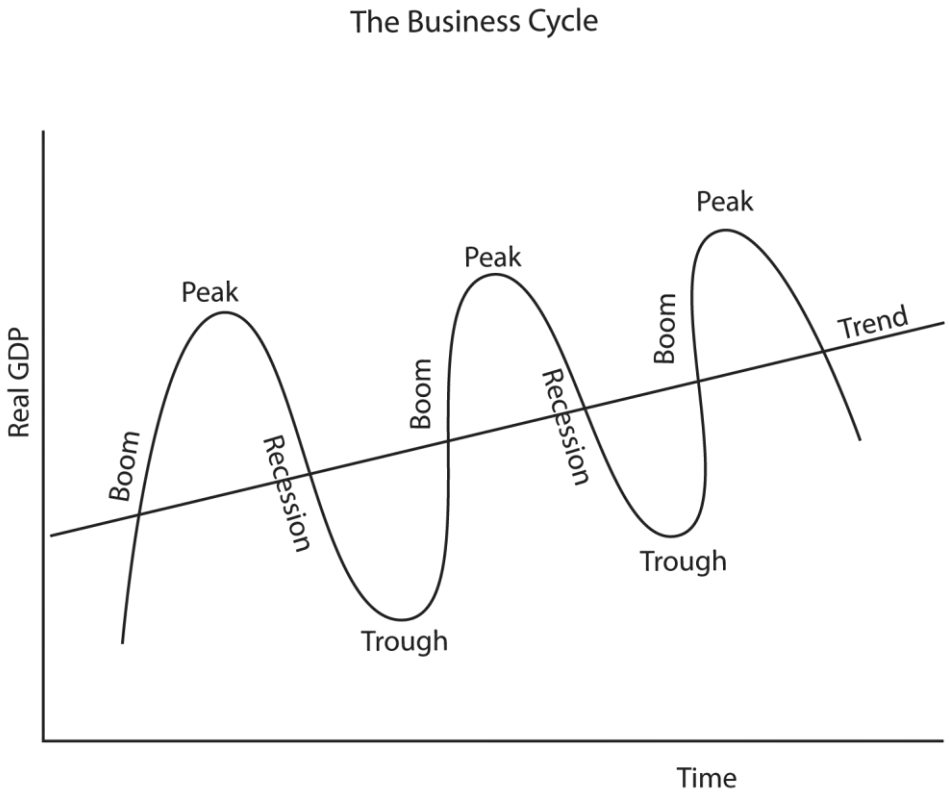
Newell and Steglick (2003) have provided a top ten list of different risk factors in the property industry:

1. Environmental
2. Time delay
3. Land cost
4. Acquisition terms
5. Approval processes
6. Cost increase
7. Political
8. Experience
9. Engineering
10. Market
11. Delivery timing

While some of the risks may be out of a developer's control, certain aspects of the risks can be controlled and mitigated. For instance, experience, generally brings a deep understanding of one's industry. Other aspects such as Land Cost and Time Delay can be negotiated on and managed respectively. Newell et al. (2003) believes that developers use in-house management of critical processes, contractually allocating risk to other parties through outsourcing and quality assurance procedures to mitigate risk. Delivery timing is one of the most crucial of the risk factors, which can be controlled by the developer through extensive experience, and knowledge of the property cycle.

2.5. Business Cycle Theory

Mitchell (1927) conducted business cycle research in the infancy of this concept. He investigated and established theories on economic cycles for the National Bureau of Economic Research in the United States of America that are used as the basic fundamentals of cyclic activity in the American economy. The basis of business cycles is using certain analytical tools to organise and analyse economic data to gain a deeper understanding of the economic activity that took place over a set period.



Source: Brigham Young University-Idaho (2011)

Figure 4: The Business Cycle

Various researchers and economists have come up with different ways to analyse economic data, and various methods are internationally recognised. Whilst there are different methods of analysing the same data set, which can lead to slightly varying results, Burns and Mitchell (1946) put forth that the "…ultimate aim –namely, to attain better understand of the recurrent fluctuations in economic fortune that modern nations experience." (Burns and Mitchell 1946: 4) Their definition of business cycles is commonly referenced in various literary works as follows:

"Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycle vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitude of approximately their own". (Burns and Mitchell, 1946: 3)

Business cycles consist of durations of time where economic activity expands and contracts successively. The highest and lowest points respectively, of the expansions and contractions are known as peaks and troughs. Peaks and troughs are commonly used as indicators when analysing a data set over the given period of time, because they often signal the imminent change in the direction of the economic activity. A full cycle is measured from peak to the successive peak, or from trough to the successive trough. During a full cycle the two phases of expansion and contraction will occur once. The expansion period is from trough to peak and the contraction period is from peak to trough. Each individual period of the business cycle has been researched in-depth for years. Eckstein and Sinai (1986), Balke and Wynne (1995) and Mussa (2009) have all conducted studies specifically based on the Recovery period of the business cycle. The Recovery period is a point from where economic activity begins to increase from the downward trend that was being experienced in the recession period. This Recovery period precedes the expansion phase, as is a moment of turnaround.

For a business cycle to be accurately analysed, there needs to be an abundance of economic data available during the period selected, and the time selected needs to be of duration long enough for the said economic data to occur. Harding and Pagan (2001) outlined duration requirements and called them “censoring rules”. Burns and Mitchell (1946) were before Harding and Pagan’s (2001) time, and they created their own duration requirements when building on their research framework. A full cycle was required to last a minimum of 15 months, and each phase had to last a minimum of 5 months. Their research shows that they had a preference for using GDP an economic activity index. Other work has been published by the likes of Moore and Zarnowitz (1986) showing a preference to use a weighted average of several series of events. Burns and Mitchell (1946) were conducting their research under much more difficult circumstances than researchers of today, as today there is an abundance of economic data available. Whereas Burns and Mitchell (1946) had less data readily available to them, they, like Moore and Zarnovitz (1986) focused on the synchronisation across many series.

Researchers and analysts of today, who are analysing the developed and emerging markets have left the reference-cycle method of business cycle analysis. They apply the algorithmic analysis methods, which are applied to a countries' GDP data. The algorithm is then used to analyse the data and point out turning points, which can be identified as peaks and troughs in the set duration of time. This more common concept of analysing business cycles is based on the academic framework of "deviation cycles".

According to literature some analysts such as Claessens et al. (2011) still use a methodology based on Burns and Mitchell's (1946) framework for analysing and characterising business cycles. In Claessens et al. (2011) study, they used a very basic and classic method of characterising business cycles. Their method was set out with a clear objective of producing conclusive results in the form of a detailed set of events in a chronological order focusing on the economic activity changes. That chronological order enabled Claessens et al. (2011) to effectively analyse the data by seeing turning points. It is their belief that this method is still very effective as any newly available data that is added will not compromise the outcome of the analysis, as Canova (1998) has pointed out in other similar studies that newly available data can affect the trend, thus altering the determination of the growth cycle.

According to Lottering (2010), business cycles and property cycles are linked, and their troughs and peaks will often coincide. The business cycle of a country or city can drastically affect property development, absorption rates and vacancies. Studies from Claessens, Kose and Terrones (2011) show that troughs in business cycles coincide with declines in asset prices, and decreases in access to credit. Pyhrr, Roulac, and Born (1999) found out that they were able determine the business cycle's position by analysing the real estate investment market. Studies done by Burns and Mitchell (1946), Harvey and Jaeger (1993), Hess and Iwata (1997), Pagan (1997) and Male (2011) have all used the gross domestic product as a main indicator to the business cycle. Their studies used the GDP over a period of time to measure the total production of a country. These studies enabled them to see patterns over the

years of growth and decline.

Studies completed by Claessens, Kose and Terrones (2011) based on the frequencies, duration and amplitude of business cycles focus heavily on recessions and recoveries. Their studies go on to show that when comparing the duration of advanced and emerging market's business cycles, there is very little difference between the two, to the point where it is unnoticeable.

According to Lottering (2010), over the years, South Africa's long property cycle from trough to trough would take approximately seventeen years. Whilst the property cycle was longer than the business cycle, there is a clear indication of a relationship between the two cycles as the troughs and peaks would occur in synchronised manner (with the property cycle being between one and two years behind the business cycle). Although there is a direct relationship between the business cycle and property cycle in South Africa, there can be significantly more movement in the business cycle during the span of one long property cycle. It is possible in certain instances that the downswing phase of up to two business cycles could occur within the same timeframe as one downswing of the long property cycle.

2.6. Portfolio Theory

A portfolio is a grouping of various investments. These investments can range from different industries (for instance property and finance), or different classes within one industry (stocks and bonds in the finance sector) and different localities of said investments. Portfolio management is simply the management of the various assets within the chosen category. Portfolio management is of great importance as it forms a significant part of the basis of informing portfolio decision making. Throughout the years, work has been published showing different ways to lower the risk within the asset grouping and extract maximum returns. Diversification is used as a way to lower an investor's risk in the property development industry, but is also used in other industries. According to Fabozzi, Gupta, Markowitz (2002) and Veneeya (2006) the importance of diversification has been iterated in many ways over the years which has led to

the common saying “never putting your eggs in one basket”. According to Markowitz (1952) and Sharpe (1964) diversification in portfolio theory emerged in the nineteenth century to help investors lower their risk on the stock market. Markowitz (1959) revolutionised portfolio theory, when he published his research on Modern Portfolio Theory (MPT) in 1959. Since the publication of MPT by Markowitz (1959) various researchers and analysts conducted studies with the aim of ascertaining a better understanding of diversification within portfolios.

Modern Portfolio Theory can be used to analyse properties in a portfolio or individually, hence its popularity as an analysis tool. Linter (1965), Evans and Archer (1968), Wagner and Lau (1971) and Elton and Gruber (1977) concluded in their study that 10 to 15 securities is the ideal range for eliminating systematic risk. Similar to the stock market, property investors and analysts were looking for ways to reduce risk, and maximise returns as property is a fixed asset and immobile. Financial investment instruments such as stocks and bonds are used for the sole purpose of investing. However, the property is purchased for investment purposes through capital gains, as well as usage purposes in physically occupying the development. Hence the very nature of property investments is different to typical financial investment instruments such as stocks and bonds.

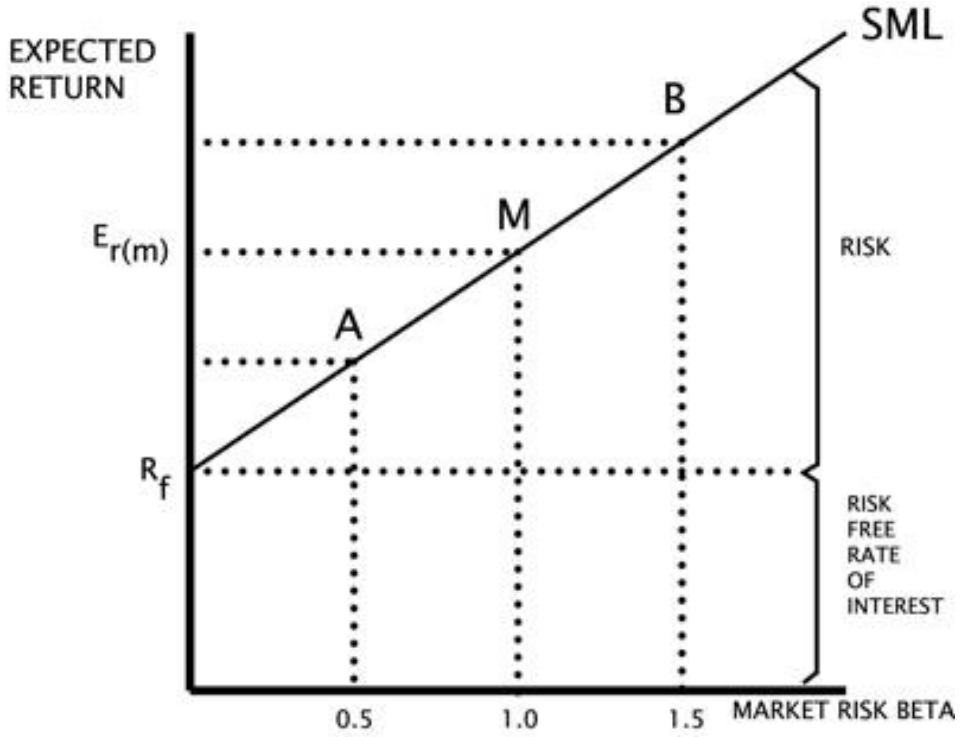
Diversification strategy research has been conducted by the following researchers, but not limited to Miles and McCue (1982), Burns and Epley (1982), Miles and McCue (1984), Hartzell, Hekman and Miles (1986), Hartzell, Shulman and Wurtzebach (1987), Corgel and Gay (1987), Mueller, Kapplin and Schwartz (1988). According to Isakson and McInish (2011), research in the 1960’s to the 1980’s was conducted with a focus of diversification of financial portfolios rather than that of property portfolios. At the time, there was a paucity of up-to-date empirical data on property markets. In the early 1980’s there was a shift towards research of diversification in property portfolios. Burns and Epley (1982) conducted a study, which was based on Real Estate Investment Trusts (REITS) micro returns data, which concluded that risk in property portfolios could be reduced in a portfolio with as little as three assets. However,

once the portfolio grew to over three assets, the risk mitigation dwindled. In the 1980's, researchers Miles and McCue (1982) similar to Burns and Epley (1982) conducted a research study based on REITS micro returns investigating means of diversification of risk in the property industry. Their study was based on dividing the country into four different regions geographically. Their initial conclusions were that diversification by property type was more beneficial by providing a better risk return to investors than diversification by four-region strategy. However, as Hartzell, Hekman and Miles (1986) expanded the scope of Miles and McCue (1982) research by extending the time frame of their research study as well as taking into account other external factors, they found that diversification by geographic location provided superior benefits to investors. Studies by Mueller and Ziering (1992) have been conducted seeking links between economic activities of cities, and property portfolio performance of the said cities. However, in 1988, Wurtzebach (1988) conducted a study in which he analysed the type and growth of employment of people in areas and put them in economic categories.

Mueller and Ziering (1992) concluded from Wurtzebach's (1988) study was that removing the geographical limitations of previous studies was a better strategy than conducting studies with too many geographical limitations. Mueller (1993) came up with a new strategy of diversification, which created a platform for a portfolio manager to increase risk-adjusted returns. This new strategy was created after investigating methods of diversification by removing geography as one of the parameters, and looking at investing solely from an economic perspective. Once geography was removed from the parameters, Mueller (1993), found a superior, efficient frontier in growth and Recovery phases of the property cycle.

Modern Portfolio Theory has evolved since Markowitz (1959) published his work. During that evolution, the Capital Asset Pricing Model (CAPM) has been discussed as a way to analyse risk and return. According to Brown (1991) and Cho (1997) market risk is unavoidable due to the fact that it is based on changes in economic activity, interest rates, unemployment, population growth, economic growth and inflation. While market risk is inherent in property

portfolio management, specific risk can be eliminated through diversification. MPT focuses profoundly on risk management. As Sharpe (1964) has shown, whilst a portfolio manager is unable to have direct control over the returns of an investment, a portfolio manager is able to manage risk. A portfolio manager and investor expect a relationship between risk and return that in an ideal world should mean the more risk, the more return. The CAPM is a popular description of this relationship. This relationship is shown by the security smart line (SML) theory in Figure 5.



Source: Sharpe (1964)

Figure 5: Security Market Line / Capital Asset Pricing Model

The horizontal axis represents portfolio risk, while the vertical axis represents expected return of the portfolio. Figure 5 shows the positive linear relationship between risk and expected return, while also displaying that some investments have zero risk. As it has been stated that CAPM has been widely accepted as a method of analysing the risk return relationship, other work by the likes of Fama and French (1992), and Malkiel and Xu (1997) have been published disagreeing with its validity for different reasons. Fama and French (1992) conducted a study that showed long-run average returns and beta (risk

measure) do not correlate. Five years later, Malkiel and Xu (1997) conducted a study, which they showed that beta (risk measure) is not sufficient enough to be used as a sole predictor of expected returns in the future.

While there have been many studies conducted on portfolio theory, the study completed by Markowitz (1959) still remains popular amongst property analysts and researchers to this day. However, over the years there have been doubters of the usage of MPT's to accurately access property portfolios. Young and Grieg (1993) published work clearly showing that MPT should not be used for property portfolio analysis, which was proven mathematically. Young and Grieg (1993) also believed that because the properties are heterogeneous, MPT could not simply be adapted from the stock market to the property market. Although, Young and Grieg raise valuable points, Ali (2006) pointed out that in the comparison study that Young and Grieg (1993) conducted supporting their theory of MPT not being a valid tool for analysis, they used two different properties, which gave them vastly different results. From a macroeconomic perspective, it is key that all of the entities involved in property development, such as a developer, investor, and financier greatly understand portfolio management. A major entity with a robust balance sheet and access to finance, may look at diversification not only within a certain neighbourhood of a city, but rather on a larger scale of certain cities within a country.

2.7. Spatial Theory

Property development is subject to microeconomic and macroeconomic factors. On a macro level, there are factors such as property cycles, business cycles, national economic performance, population growth, national and regional spatial planning, global economic performance, GDP growth and social dynamics that should be taken into consideration before embarking on a new property development. Subsequent to the necessary macroeconomic factors being in sync, on a micro level, there are various stakeholders which need to be aligned before investment is committed to a new property development. The different stakeholders on a micro level include the developer, financier, landowner, property agents, construction companies, and

municipal developments. According to Goodchild and Munton (1985), Adams et al. (1985) and Adams and May (1991), social interactions between the different parties are seen as an important element in the development process.

In published works by Alexander (1965), Byrne (2003), De Roo (2004), the complexity of the various parties and decisions necessary needed before embarking on a property development are outlined. The roles of the different stakeholders are often dynamic with each party having one or more motives when participating in a property development. Financial gain and lowering risk are the overarching commonalities between all of the parties, however, there can differences between the motives of the developer, and the municipality. The developer would be looking for the highest internal rate or return (IRR) combined with the lowest risk on a project, while the municipality is concerned with serving its citizens and ensuring the best use of land is selected and implemented in each development.

With a microeconomic focus, Corgel and Gay (1987:258) conducted a study using employment data from the thirty largest standard metropolitan areas in the United States, which they deduced that there is a *potential* of risk reduction through diversification by geographical location. In the study that Corgel and Gay (1987) conducted, diversification of mortgage portfolios was explored. During this exploration, it was found that mortgage portfolio holders knew to diversify location as their portfolios should not be limited to the same or few locations. Ideally, diversification of mortgage portfolios should be diversified across various areas to reduce their risk in their portfolio. Corgel and Gay (1987) found that whilst there are different diversification strategies, diversification by mean-variance efficiency was the greatest diversification method of those that they tested. In conclusion to their study, they recommended that mortgage portfolio investors, should diversify across various locations (not only large metropolitan areas) to accomplish a fruitful risk-return relationship.

Studies such as Hartzell, Hekman and Miles (1986), Mueller and Ziering (1992) and Mueller (1993) have shown that investors are more inclined to invest in

certain regions. Although studies such as Mueller (1993) place a greater importance on economic factors in their study there is no denying the importance of diversification by location, indicating its significance in investor decision-making.

2.8. Conclusion

Research has been completed focusing on cycles over the years, which has been summarised in the literature review. Understanding property cycles is of great importance on a micro- and macroeconomic level, as the industry has a colossal effect on a country's GDP. On a macroeconomic and microeconomic level, research shows that the property variables, specifically office market variables is characterised by cyclic behaviour. While it has been shown that there are some researchers that believe the property cycle theory is of no great importance, it has also been shown that many believe that the understanding of property cycle theory is imperative to the understanding and success of a property sector. Various researchers have contributed heavily to the framework of property cycles and business cycles; in particular Mitchell (1927) has shown the there is a link between financial markets cycles and business cycles. Mitchell later collaborated with many respected minds on the matter of property cycles and business cycles, most famously Burns and Mitchell (1946).

Over the years, there has been an abundance of empirical research on property cycles that has been completed by schools of thoughts. Identifying and analysing property cycles come across as more of an art than a science sometimes, as various methods can still be used to attempt to solve the same questions.

American and European authors have published the bulk of the literary work in this chapter, however, there is still value and knowledge to be gained from other authors outside of America and Europe. There is a shortage of studies and literary work from South African authors and analysts regarding property cycles in a South African context. The study that will be conducted in this body of work, will attempt to bridge the information gap, and bring international

frameworks into a South African context.

3. Research Methodology

3.1. Introduction

According to the Investment Property Databank (2013) every year investors spend billions of rand investing in the South African property market through various channels. Investors will look for the maximum return possible while protecting their investment. Miles and McCue (1982) showed that one form of protecting the investment is through diversification. Diversification in a property portfolio may be achieved in various ways such as property type, property price, location, market (office, residential, industrial) etc. This study has chosen location as the main diversification tool, in an attempt to ascertain whether an investor could diversify their portfolio and achieve similar economic performance by investing in the same property class and type throughout different cities in the same country. Over this chapter the methods, measures, data sources, as well as the strengths and weaknesses of the data used in this study will be explored. The process of the study will be outlined to give an understanding to the conclusion presented at the end of this study.

3.2. Methods

This study used a classical comparative analysis methodology using space and time. According to Deutsch (1987) comparative investigative methods have been used for over 2000 years. The act of comparing two or more things is a very basic fundamental aspect of scientific research. This study investigated similarities and differences between geographic areas across a number of indicators within a given time frame and bench marked it against the national performance.

The approach taken while conducting research was deducted, where information was presented and conclusions were subsequently drawn following analysis of the data. A deductive research approach is a linear approach. The first step is conducting literature search and collecting data. This is followed by analysing the information. The final step involves presenting the results thereof and deducing conclusions. Quantitative data is used in the conducting of this

research. The data were drawn from financial reports, journals, property sector statistics and performance records. Specifically, the study compared three cities against each other with the nation as a benchmark across a number of indicators that measured performance of the property cycle over a period of nine years. These indicators include market rentals, vacancies, growth rates, capitalisation rates and GDP rates.

This study uses a similar comparative methodology employed by Nalugoda et al. (2014). The research methods, discussion and results presentation of Nalugoda et al. (2014) formed the basis of the conceptual framework used in this study. These researchers took longitudinal data over the period of 1999 to 2011 to conduct a comparative study using a set of variables to determine the relationship between marriage and Risk of Incident of HIV Infection in Rakai, Uganda. Although they used a completely different topic and dataset, the conceptual framework remains relevant to this study, as the effects of certain events are analysed during a set time period using the same three samples, to study relationships. The current study looks at a historical longitudinal dataset over a period of nine years, and investigates the performance of each of the three cities CBD and decentralised areas using a set of twelve variables (presented in Table 1) for comparison. Each of the market segments are compared against each other to ascertain whether there are any patterns and similarities between the performances in the dataset over the set period. Patterns and similarities in performance would be used as evidence to prove there is a relationship between the property investment cycles of Cape Town, Durban and Johannesburg and the national property cycle. The results of this study may serve as a platform for an econometric analysis detailing the performance of major cities.

Subsequent to the initial comparative study, a construction and analysis of correlation matrices is used in this study. The framework was adapted from Eichholtz et al. (1995) who used correlation matrices to analyse portfolio diversification by property type (and most relating to this study) and by region.

Correlation between arrays of data are calculated as follows according to Hays (Hays 1981):

$$Correl\ (X,Y) = \frac{\Sigma\ (x-\bar{x})(y-\bar{y})}{\sqrt{\Sigma\ (x-\bar{x})^{2}\Sigma\ (y-\bar{y})^{2}}} \qquad (3.2.1)$$

$Correl\ (X,Y)$ = Correlation of array 1 and array 2

$\bar{x}$ = the sample means of array 1

$\bar{y}$ = the sample means array 2

The purpose of this section of the study was to establish which city and market had the greatest total return, and to analyse whether a set(s) of portfolio combinations could provide similar returns with lower risk than investing solely in one city's market over the chosen period. To assess the risk-return relationship of the investment the Coefficient of Variation (CV) is used to measure the magnitude of the standard deviation. This calculation is achieved by dividing the standard deviation by the mean. The simplistic calculation of the CV can be especially useful when the only knowledge of the dataset is the mean. Total Return was selected as the indicator for the comparative analysis of portfolio combinations. Various portfolio combinations were structured to present an opportunity to seek the most suitable investment combination over the set period of time within the selected parameters. The analysis was conducted by calculating the Standard Deviation, Mean and Coefficient Variation of a portfolio consisting of each market segment being invested in equally. Further combinations were calculated by investigating different investment combinations using the following combinations:

- Durban CBD – Johannesburg Decentralised
- Cape Town CBD – Durban CBD
- Durban CBD – Johannesburg CBD
- Johannesburg CBD – Cape Town CBD
- Cape Town CBD – Durban Decentralised
- Johannesburg Decentralised – Durban Decentralised

- Cape Town Decentralised – Johannesburg CBD
- Cape Town Decentralised – Johannesburg Decentralised
- Cape Town Decentralised – Durban Decentralised

The presented combinations above were used to calculate the Standard Deviation, Mean and Coefficient Variation of the portfolio combinations. A comparative analysis was then used to investigate the benefits of diversification by attempting to establish whether an investor would have achieved higher or similar returns with lower risk by investing solely in one market segment, equally across all markets, or using a diversified portfolio combination.

The next step was to present the Efficient Frontiers of portfolio combinations to analyse the risk and return relationship between the different combinations as correlation matrices are limited in that they do not take into consideration the risk-return relationship. The Efficient Frontier was derived from Modern Portfolio Theory. It is a device used to express the optimal returns achievable while taking into account risk (Corgel and Gay 1987).

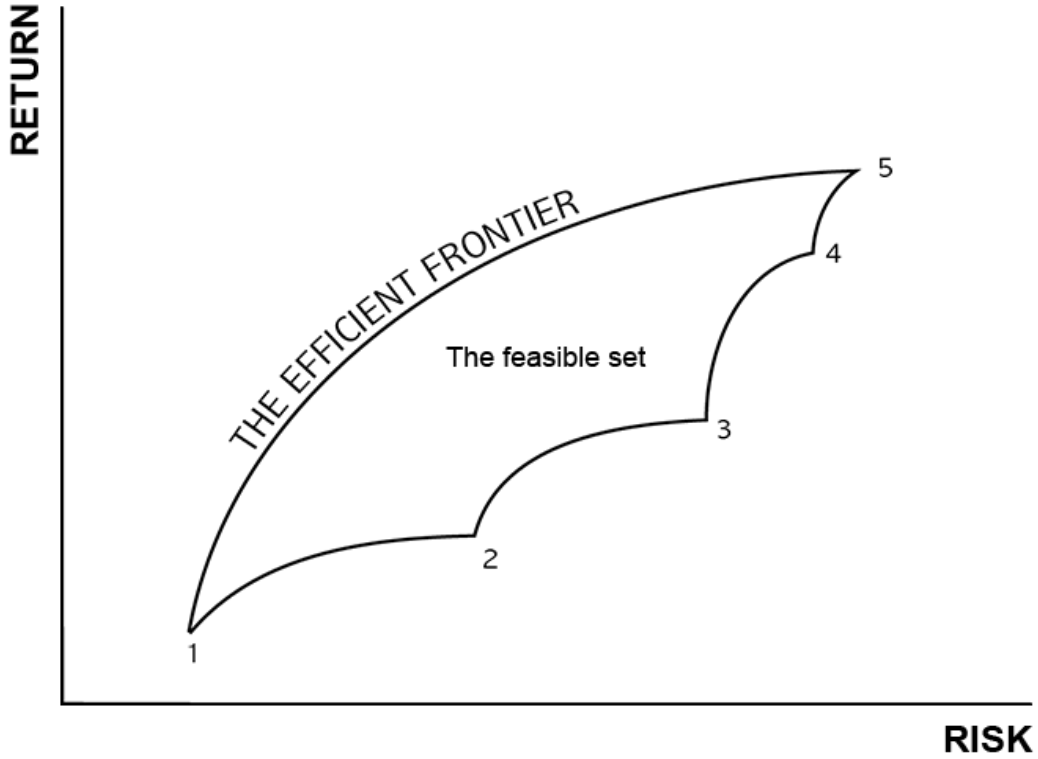


Figure 6: The Efficient Frontier

The Efficient Frontier is presented as a percentage on a x axis (Return expressed as a percentage) and y axis (Risk expressed as a percentage; Standard Deviation), with the curve representing the portfolio showing the investment options from low to high risk along the curve. It's important to keep in mind, that there is no preferred point along the Efficient Frontier. Figure 6 presents an example of a five-asset portfolio. The ideal investment opportunities lay along the curved line known as *The Efficient Frontier*. According to Hoesli and MacGregor (2000) the investment combinations that are along the Efficient Frontier are mean-variance; thus the greater the risk the greater the return. The choice an investor makes, depends on the amount of risk the investor is willing to take. This section of the study intended to measure the benefits of diversification by location. The performance of the three different investment methods were investigated; Equally Investing across all of the selected market segments, Investing Individually in each of the selected market segments and different portfolio combinations amongst the selected market segments. Firstly the Total Return data is presented in a longitudinal format for the period 2001-2009. The Standard Deviation, Mean and Coefficient Variation have already been calculated for the Individually Invested and Equally Invested portfolios as they are used as the basis for the presenting the Efficient Frontiers. Various portfolio combinations were created with an incremental weighting system (presented in Appendix 7.14). The portfolio combinations were designed to seek an optimal combination which presented higher returns coupled with lower risk. The most optimal combination was then compared to being Equally Invested across all selected market segments, and Individually Invested in each of the selected market segments.

Researchers such as Corgel and Gay (1987) used efficient frontiers when investigating diversification by location using historical employment data across various metropolitans in the United States. A similar approach was used in the current study. The data used for the calculation of efficient frontiers was derived from the Investment Property Databank (2013). According to Hays

(1981) the *mean* is calculated by taking the average of the returns calculated during the selected timeframe and dividing by the total number.

$$M = \frac{\sum_i x_i}{N} \quad (3.2.2)$$

x_i = score of the observation labelled i

N = number of observations

The standard deviation measures the variability in a risk profile and it is used to measure the total risk of an investment (Reilly and Brown 1996). Hoesli and MacGregor (2000) calculate the standard deviation as follows:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n}(\chi_{i-\bar{x}})^2}{n}} \quad (3.2.3)$$

σ = the standard deviation

$\bar{x}$ = the average (mean) return

χ_i = individual observations

n = the number of observations

The final analysis component of this study, includes assessing the volatility, risk and average returns of the different portfolio combinations and comparing them against an investors choices of investing solely in one market and equally across all markets. In this component of analysis, the study seeks to present whether an investor could lower their risk and achieve similar or higher returns with a less volatile investment combinations.

The objectives of the study were met through the following:

- Answering questions (e.g. is there a relationship between the property investment cycles of Cape Town, Durban and Johannesburg and the national property cycle?)

- Determining the Units of analysis (Cape Town, Durban, Johannesburg CDB and decentralised markets)
- Determining the logic linking the data (pattern matching, time series analysis)
- Criteria for interpreting the findings (including and incorporating important benchmarks for comparison)

To accurately address the research questions, a study is presented on the framework, theories and publications relevant to the property cycle. This meticulous investigation is undertaken to see if similar studies have been published locally or internationally. Beyond answering the research question, expectations are for the study to identify research gaps such as the lack of research by South African analysts on studying the relations between the property cycle of the three cities of Cape Town, Durban and Johannesburg.

3.3. Study Location and Measures Used

The need for comparative study comes from having an abundance of South African office market performance data, yet there is a lack of studies which investigate whether a property investor could diversify his/her portfolio by investing in the same property class and type in different cities in South Africa. The three chosen cities for this study are Cape Town (Western Cape), Durban (Kwa-Zulu Natal) and Johannesburg (Gauteng).

The following parameters were set to conduct this study:

1. Cape Town, Durban and Johannesburg will be the only three individual cities which will be compared against each other, and against the national performance as a whole.
2. Central Business Districts and Decentralised areas of the three cities will be the only samples used for comparison.
3. Only the following twelve indicators (and their sources) are used in the comparative analysis:

Data Variables:	Data Source:	Form Of Data
Office Vacancies	IPD	Rate
Office Capitalisation Rates	IPD	Rate
Office Gross Rental Receivable	IPD	Figure
Office Base Rental Yield	IPD	Rate
Office Base Rental Growth	IPD	Rate
Office Total Return	IPD	Rate
Office Income Return	IPD	Rate
Office Capital Value	IPD	Figure
Number of Office Investments	IPD	Figure
Gross Domestic Product	The World Bank	Rate
Inflation	The World Bank	Rate
Prime Lending Rate	SARB	Rate

Table 1: Data Sources[2]

The twelve variables are essential indicators to measure performance, as individually each variable provides pieces of information that dictates where the property cycle is. The chosen variables were derived from the Investment Property Databank (2013) dataset. The twelve selected variables are units of measurement that allow for the facilitation of a comparative study. There is an abundance of available data for each unit of measurement for each city and area. Investors will often look at a combination of the variables in investment decision making. Vacancies are measured as a percentage of total gross lettable area that is still available for leasing to a tenant. Vacancy rates are a measure of demand and supply which assist industry stakeholders in understanding the cycle of the property market, and when to add supply to the said market. A capitalisation rate is expressed as a percentage return based on the forecasted income of the property. The capitalisation rate is helpful for investors looking to establish the intrinsic value of a property. Gross rental receivable is the total amount the property owner receives on a monthly basis from their tenant for the leasing of the lettable area. Rentals are the basis of income for commercial office property. Base rental yield is the base rent which excludes recoveries (the minimum or initial rent that must be paid by the tenant on a monthly basis to the landlord according to the lease) expressed as a percentage of the capital value of the property. Base rental growth is the

[2] The complete data set used in this city is included in the Annexure.

increase in base rent on the property within a timeframe (usually one year) expressed as a percentage of the base rent of the same property from the timeframe. Total return is the sum of income return and capital growth during the period of one month within the timeframe expressed as a percentage. Income return is the net income of a property expressed as a percentage of the capital employed in the said property over a timeframe. Capital value is the amount a property is valued at on the open market by an accredited valuation professional. The number of investments is defined as the combination of the number of properties which were purchased and new developments brought onto the market within the timeframe (usually one year). The gross domestic product of a country is measured by a combination of tax income from the country and the total economic value created by all residents while subtracting any subsidy which do not hold any value in the product. An aggregated value based on 2000 USD dollars is used to express the GDP of any country. Gross domestic product is very useful for ascertaining the size of a country's economy as well as the expansion or contraction phases over a period of time. Inflation is expressed through the Consumer Price Index by showing increase or decrease in average price of a bag of goods and services for an average resident of a country over set periods of time. Each of these indicators are of great importance to property investors when seeking investment opportunities in a market. Each indicator individually and in combination are used to calculate turning points in a property cycle, which lead an investor to decide when to invest or disinvest from a market.

Each of the three cities represents a regional group. Within each regional group, two markets were investigated which were the Central Business District Office Market and the Decentralised Office Market.

4. The following areas and cities will be used for the comparative analysis:

Central Business Districts Chosen For Study:
Cape Town
Durban
Johannesburg

Table 2 Central Business Districts Chosen For Study

Cape Town Decentralised Suburbs Chosen For Study: (Cap Rates)	Durban Decentralised Suburbs Chosen For Study: (Cap Rates)
Bellville	Berea
Century City	Essex Terrace
Claremont	La Lucia
Westlake	West Way

Table 3: Cape Town Decentralised Suburbs Chosen For Study (Cap Rates)

Table 4: Durban Decentralised Suburbs Chosen For Study (Cap Rates)

Johannesburg Decentralised Suburbs Chosen For Study: (Cap Rates)	
Braamfontein	Rivonia
Bryanston	Rosebank
Parktown	Sunninghill
Randburg	

Table 5: Johannesburg Decentralised Suburbs Chosen For Study (Cap Rates)

Cape Town Decentralised Suburbs Chosen For Study: (Vacancy Rates)	Durban Decentralised Suburbs Chosen For Study: (Vacancy Rates)
Durbanville/Bellville	Berea
Claremont/Rondebosch	Essex Terrace
Other Cape Town	La Lucia
	West Way

Table 6: Cape Town Decentralised Suburbs Chosen For Study: (Vacancy Rates)

Table 7: Durban Decentralised Suburbs Chosen For Study: (Vacancy Rates)

Johannesburg Decentralised Suburbs Chosen For Study: (Vacancy Rates)	
Bedfordview/Bruma	Rivonia/Edenburg
Bryanston/Epsom Downs	Rosebank
Hyde Park	Sandton CBD
Houghton/Illovo	Sandton Environs
Parktown	Sunninghill/Fourways
Randburg	Woodmead

Table 8: Johannesburg Decentralised Suburbs Chosen For Study: (Vacancy Rates)

Cape Town Decentralised Suburbs Chosen For Study (Gross Rental Receivable)	Durban Decentralised Suburbs Chosen For Study (Gross Rental Receivable)
Bellville	Berea
Century City	Essex Terrace

Pinelands
Rondebosch/Newlands
Tygerberg Hills
Tygervalley Area
V&A Portswood Ridge

Table 9: Cape Town Decentralised Suburbs Chosen For Study (Gross Rental Receivable)

La Lucia
Westville
West Way

Table 10: Durban Decentralised Suburbs Chosen For Study (Gross Rental Receivable)

Johannesburg Decentralised Suburbs Chosen For Study (Gross Rental Receivable)	
Bedfordview/Bruma	Rosebank
Bryanston/Epsom Downs	Sandton CBD
Houghton/Illovo	Sandton Environs
Parktown	Sunninghill/Fourways
Randburg	Woodmead
Rivonia/Edenburg	

Table 11: Johannesburg Decentralised Suburbs Chosen For Study (Gross Rental Receivable

Cape Town Decentralised Suburbs Chosen For Study (Capital Values)
Durbanville/Bellville
Claremont/Rondebosch
Other Cape Town

Table 12: Cape Town Decentralised Suburbs Chosen For Study (Capital Values)

Durban Decentralised Suburbs Chosen For Study (Capital Values)
Berea
Essex Terrace
La Lucia
Westville
West Way

Table 13: Durban Decentralised Suburbs Chosen For Study (Capital Values)

Johannesburg Decentralised Suburbs Chosen For Study (Capital Values)	
Bedfordview/Bruma	Rosebank
Bryanston/Epsom Downs	Sandton CBD
Houghton/Illovo	Sandton Environs
Parktown	Sunninghill/Fourways
Randburg	Woodmead
Rivonia/Edenburg	

Table 14: Johannesburg Decentralised Suburbs Chosen For Study (Capital Values)

Cape Town Decentralised Suburbs Chosen For Study (Number of Investments)
Durbanville/Bellville
Claremont/Rondebosch
Other Cape Town

Table 15: Cape Town Decentralised Suburbs Chosen For Study (Number of Investments)

Durban Decentralised Suburbs Chosen For Study (Number of Investments)
Berea
Essex Terrace
La Lucia
Westville
West Way

Table 16: Durban Decentralised Suburbs Chosen For Study (Number of Investments)

Johannesburg Decentralised Suburbs Chosen For Study (Number Of Investments)	
Bedfordview/Bruma	Rosebank
Braamfontein	Sandton CBD
Bryanston/Epsom Downs	Sandton Environs
East Rand	South Johannesburg
Houghton/Illovo	Sunninghill/Fourways

Hyde Park	West Rand
Parktown	Woodmead
Randburg	Rivonia/Edenburg

Table 17: Johannesburg Decentralised Suburbs Chosen For Study (Number Of Investments)

Cape Town Decentralised Suburbs Chosen For Study (Base Rental Yield)
Durbanville/Bellville
Claremont/Rondebosch
Other Cape Town

Table 18: Cape Town Decentralised Suburbs Chosen For Study (Base Rental Yield)

Durban Decentralised Suburbs Chosen For Study (Base Rental Yield)
Berea
Essex Terrace
La Lucia
Westville
West Way

Table 19: Durban Decentralised Suburbs Chosen For Study (Base Rental Yield)

Johannesburg Decentralised Suburbs Chosen For Study (Base Rental Yield)	
Bedfordview/Bruma	Sandton CBD
Braamfontein	Sandton Environs
Bryanston/Epsom Downs	Sunninghill/Fourways
Houghton/Illovo	Woodmead
Parktown	Rivonia/Edenburg
Rosebank	

Table 20: Johannesburg Decentralised Suburbs Chosen For Study (Base Rental Yield)

Cape Town Decentralised Suburbs Chosen For Study (Base Rental Growth)
Durbanville/Bellville
Claremont/Rondebosch
Other Cape Town

Table 21: Cape Town Decentralised Suburbs Chosen For Study (Base Rental Growth)

Durban Decentralised Suburbs Chosen For Study (Base Rental Growth)
Berea
Essex Terrace
La Lucia
Westville
West Way

Table 22: Durban Decentralised Suburbs Chosen For Study (Base Rental Growth)

Johannesburg Decentralised Suburbs Chosen For Study (Base Rental Growth)	
Bedfordview/Bruma	Rosebank
Bryanston/Epsom Downs	Sandton CBD
Houghton/Illovo	Sandton Environs
Parktown	Rivonia/Edenburg

Table 23: Johannesburg Decentralised Suburbs Chosen For Study (Base Rental Growth)

Cape Town Decentralised Suburbs Chosen For Study (Income Return)
Durbanville/Bellville
Claremont/Rondebosch
Other Cape Town

Table 24: Cape Town Decentralised Suburbs Chosen For Study (Income Return)

Durban Decentralised Suburbs Chosen For Study (Income Return)
Berea
Essex Terrace
La Lucia
Westville
West Way

Table 25: Durban Decentralised Suburbs Chosen For Study (Income Return)

Johannesburg Decentralised Suburbs Chosen For Study (Income Return)	
Bedfordview/Bruma	Rosebank
Bryanston/Epsom Downs	Rivonia/Edenburg
East Rand	Sandton CBD
Houghton/Illovo	Sandton Environs
Hyde Park	South Johannesburg
Parktown	Sunninghill/Fourways
Randburg	Woodmead

Table 26: Johannesburg Decentralised Suburbs Chosen For Study (Income Return)

Cape Town Decentralised Suburbs Chosen For Study (Total Return)
Durbanville/Bellville
Claremont/Rondebosch
Other Cape Town

Table 27: Cape Town Decentralised Suburbs Chosen For Study (Total Return)

Durban Decentralised Suburbs Chosen For Study (Total Return)
Berea
Essex Terrace
La Lucia
Westville
West Way

Table 28: Durban Decentralised Suburbs Chosen For Study (Total Return)

Johannesburg Decentralised Suburbs Chosen For Study (Total Return)	
Bedfordview/Bruma	Rosebank
Bryanston/Epsom Downs	Rivonia/Edenburg
East Rand	Sandton CBD
Houghton/Illovo	Sandton Environs
Hyde Park	South Johannesburg
Parktown	Sunninghill/Fourways
Randburg	Woodmead

Table 29: Johannesburg Decentralised Suburbs Chosen For Study (Total Return)

3.4. Data Sources

The bulk of the data used for this study were compiled by the Investment Property Databank (2013) and their method for data collection and index construction is outlined as follows:

In 1994 contributors agreed to a single valuation method to give the Local Market Report a common basis. The report is compiled from internally and externally audited individual buildings and portfolio management reports, valuations and industry performance data submitted by property companies directly to Investment Property Databank (2013) for research purposes. This report shows the performance and returns of direct investment in property in South Africa.

The report includes all properties or investments which are held from one valuation to the next within a year. These properties are called standing investments, since they have not been involved in any transaction throughout the given year. The report excludes any property or investment involved in

major renovation, purchase and sale or currently under development in a given year.

One calendar month is the measurement period in which all Investment Property Databank (2013) performance measures are value-weighted. Open market valuations of all properties individually or within a portfolio are the basis of all valuation reports used in the report. One calendar month is also the minimum time frame in which the return calculation on all performance measurements are calculated. Any returns which need to be calculated over a longer period of time were subject to chain-linking of individual monthly returns.

A time-weighted basis was used for calculating all quarterly and annual performance measures and indices to give consistency across different markets.

Total return was calculated as the sum of income and capital within the measurement period. The calculation becomes more complex when calculating multiple period income return and capital growth. When compounded total returns are combined with income and capital returns a cross-product is created, because the combination of multiple period income return and capital growth do not directly equal total return.

3.5. Data Strengths and Limitations

The greatest strength of the data, is that is from the largest compiled property database in the country. While the fluidity of the database can be seen as a weakness, it can also be seen as a strength. The database can be retroactively improved at any point in time, meaning any additional data improvements made between the periods of 2009 to 2015 would have benefitted the accuracy of this study. The Investment Property Databank (2013) is familiar and well respected amongst property professionals and investors in South Africa. Since all contributors have agreed to a single valuation method in 1999, the chosen valuation method is widely accepted as the industry standard.

There are limitations to the data, in that data is provided on a voluntary basis.

The Investment Property Databank (2013) South African Index has a vast amount of data however, it is mainly based on a system of individuals and companies which choose to contribute to its database, hence the database is fluid. In spite of the fact that the data is provided by various contributors around the country, the bulk of the data is still compiled primarily at one source; additional data sources may have impacted the study for the better.

Although there are limitations to the data, this study is still appropriate and has value-add. The objectives of this study were to investigate whether a property investor could diversify their property portfolio by investing in the same property class and type throughout multiple cities in South Africa. This objective can still be met even with the data limitations stated above.

3.6. Approach to Data Analysis

The data collected is reproduced in the appendix for ease of reference. Subsequent to the data compilation, an analysis was completed using indicators to measure the performance. Each city's CBD and decentralised commercial office market's performance was analysed over nine (9) years. Fanning's (2007) Four Cycle Model was initially used for analyses by identifying turning points in the performance data. Those turning points were then used to identify the different phases of the property cycle. Subsequent to establishing a national property cycle for the office market, further investigation into the individual performance of CBDs of all three cities' decentralised markets using the twelve (12) indicators as measurement tools as completed to ascertain whether there were any noticeable patterns in the performance of the three cities' markets. Within the analysis of the data, the drivers and causes were explored to gain a deeper understanding of the increases and declines in the indicators that were experience during the timeframe of the study. The performance of all three cities was then presented for comparison against each other and against the national office performance (the benchmark).

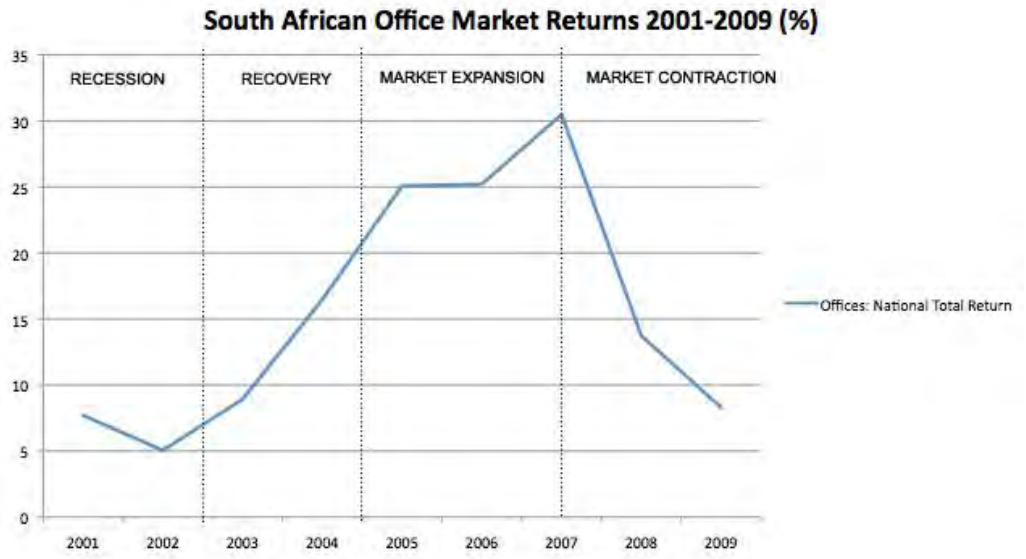
4. Analysis of Data

4.1. Introduction

The analysis that takes place stems from the research methodology previously presented. The analysis seeks to answer the research questions and test the hypothesis firstly by investigating whether there is any conclusive evidence of a relationship between the property cycles of the three South African cities, Cape Town, Durban and Johannesburg and the national property cycle. Secondly the analysis is intended to substantiate the research question by providing evidence that there is a recognisable pattern between the property investment cycles of the three chosen cities.

The timeframe of the data was between the years 2001 to 2009, and each year has been individually analysed to provide conclusions on the upswings, contractions, troughs, peaks and external factors of the property cycles of the three cities.

The basis of the quantitative analysis stems from seeking greater in-depth knowledge of the property cycle during the years of 2001 to 2009. To assess how the office market performed during the given years, Investment Property Databank (2013) all-office data was compiled and Total Return across the entire country was used as a method of measuring the property cycle.



Source: Investment Property Databank (2013)

Chart 1: South African Office Market Returns (2001-2009)

Chart 1 comprises four periods which are used to identify the office property cycle.

	2001	2002	2003	2004	2005	2006	2007	2008	2009
CBD:CPT	**9,74**	**6,52**	7,06	**21,19**	**31,8**	24,29	27,56	9,35	7,57
CBD:DBN	-7,9	-9,05	**13,48**	11,98	23,3	**25,84**	**54,81**	11,99	**11,94**
CBD:JHB	6,36	-2,74	**12,83**	6,1	16,05	**25,3**	24,42	**26,01**	10,7
DEC:CPT	6,4	**6,16**	6,97	14,05	**27,88**	23,74	23,7	**14,71**	4,49
DEC:DBN	**15,62**	3,5	**18,34**	8,54	**33,22**	**29,92**	26,28	**14,21**	7,69
DEC:JHB	6,64	4,1	5,31	12,28	17,64	21,19	25,97	8,91	7,02
National	7,71	5,05	8,92	16,47	25,08	25,22	30,48	13,73	8,31

Source: Investment Property Databank (2013)

Table 30: Office Market Total Returns (2001-2009)

Recession

The national office market total return declined by 2% points the period of 2001 to 2009. Vacancy rates during the same period were increasing and remained substantially higher than the following years. High vacancy rates were coupled with the number of investments dwindling. Income Return during this period dropped by 0.73% points from 11.0% to 10.3% during this period signaling further losses for investors. Although inflation in South Africa during this period

decreased, gross rental receivables on average increased by R 1.30/m2. It was during this period in which the office market reached its trough.

Recovery

Economic growth during this period had a positive impact on the national office property market. The gross domestic product growth of the country declined by 0.8% points during the year 2003, however immediately returned to growth by 1.7% points the following year leading to the highest GDP growth within the past four years. Inflation decreased dramatically by 4.5% points, coupled with prime rates decreasing from 17% to 11% thus creating favourable terms for investment promoting growth. Office vacancies began to decrease (by 4.5% points) during 2003-2004, which would continue for the following years which also suggesting that an increase in gross rental receivables would be imminent. Investors tested the market, as the number of office investments increased by 39 during the period of 2003-2004. This suggests that during this period there was not only a growth in economic activity, but also a growth in development and investment activity.

Market Expansion

The period 2005 to mid-2007 was the peak of this property cycles. Vacancies dropped drastically by 4.8% points, which was coupled by a growth of R17 per m2 during the same period. During the years 2005 to 2007, total return remained rather flat at approximately 25%, and income return performed similarly remaining flat at approximately 10%. However in 2007, there was a decrease in income return (0.7% points) but an increase of 5.3% points in total return. Inflation continued its upward trend during the periods 2005 to mid-2007 capping off at 7.1% in 2007, which is the highest it achieved since 2002 in the Recovery phase. National GDP growth hovered around 5% during the years 2005 to mid-2007, capping off at 5.5% in mid-2007 before heavily declining for the following years. In this phase, there was an over-supply in the market of commercial office space nationally. This is shown through rentals steadily

increasing, vacancies dropping, however the number of investments nationally began to decline year on year as developers recognised the peak of the cycle.

Market Contraction

The number of investments continued to decrease throughout the period of mid-2007 to 2008. In 2009, there was an increase in property investments nationally by 25 from the previous year of 2008 rising to 722, which was the highest property investments had been since 2006. Less investments come as no surprise as according to BBC News (2009) the global credit crisis began to pick up steam in 2007 through to 2008. The housing bubble burst in the United States had a devastating impact across its financial markets, as well as global stock and investment markets. The impact was felt in South Africa (albeit not as badly as the United States), as vacancies continued to increase year on year capping off at 10% in 2009. The vacancies rising, coupled with low office investments suggest the office market was in over-supply during that period. Income return continues to remain subdued, hovering around 9.5% during that Phase. Total return on the other hand took a substantive decline. In 2007, national office total return was 30.5% and by 2009, total return had declined all the way to 8.3%. During this phase, the cycle was heading towards another Recession.

In this section of this research, further in-depth research takes place which includes the twelve variables listed in Chapter 3, detailed throughout the timeframe of 2001 to 2009. The twelve variables that were used were chosen to gain a deeper understanding of how the national office Total Return is compiled, as each of those variables have an impact on total return.

According to the Department of Trade and Industry and Deloitte & Touche (2012), traditionally, South Africa's economy has been based on the primary sectors. In the past, South Africa put a heavy emphasis on mining, minerals and agriculture. More recently there has been a shift in South Africa's economy. The economy has shifted from relying on the primary sector, to now being comprised of the tertiary sector. The tertiary sector is driven by the

performance of communications, retail and wholesale and tourism. Due to the improvement of communication structures, infrastructure and globalisation, South Africa has begun to focus more on technology, finance and e-commerce and becoming a knowledge-based economy opening more opportunities for growth in the office market.

4.2. Chosen Cities for the Study

Only three cities were chosen for this study. All three cities are located in South Africa with Cape Town being a coastal city located in the south. Durban is also a coastal city in the east and Johannesburg being a landlocked city centrally located. Within each city the Central Business District (CBD) and Decentralised markets were included in the sampled area.

According to the City of Cape Town (2015), Cape Town's municipal economy contributed 11% to the national GDP. This contribution makes it the second largest municipal economy in the country. Cape Town is predominately a service-driven economy as the most established economic sectors being insurance services, business services, retail, wholesale trade, communications, hospitality and financial services. The city is supported by transportation network comprised of rail, road, air and water. The Cape Town International Airport as well the Port of Cape Town serves as ports for wholesale trade domestically and internationally. The roads of Cape Town cater for various forms of transportation namely, cars, buses, meter taxis, mini-bus taxis and trucks. The extensive rail network in Cape Town provides transportation to daily commuters from the northern and southern suburbs to and from work in the city. The wealth of the city is predominately found in the southern suburbs, and Atlantic Seaboard area (Amoils 2014). The city of Cape Town's unemployment rates in the formal sector ranged from around 14% to around 20% during the period of 2001 to 2008 according to The Department of Economic Development's Economic Research Unit (2009).

South Africa is a mineral rich country producing various commodities, with gold being of particular importance. According to Makgobathe (2014)

Johannesburg's first discovery of payable gold dates back to 1886 on the Langlaagte farm. Subsequent to this discovery, like San Francisco, the gold rush began. Mining activity increased, people from surrounding areas moved closer to work in the mines, and rural migrant labour was used in the building of the Johannesburg of today. As the country's economy developed off the backbone of gold production, Johannesburg and surrounding areas grew as more people converged in the area. According to The Department of Economic Development's Economic Research Unit (2009), the wealth of the city of Johannesburg predominately resides in the north, while the less affluent are found in the southern areas of the city. The Economic Research Unit showed that while in the city of Johannesburg there is great wealth, the city is greatly affected by poverty as approximately 20% of the city's population lived in informal settlements and a further 40% of the population did not have sufficient municipal services while living in "inadequate housing". The data of the Research Unit further shows that the City of Johannesburg is the economic hub of South Africa contributing 48% of the provinces and 17% of the national economic output. This is due to the fact that, for example Johannesburg had the greatest and growing provincial and national economic output compared to all other metro areas in the country for four years running from 2006-2009. To further illustrate this point, the City of Johannesburg's economy in 2009 was 1.5 times the size of the city of Cape Town's economy. The Economic Research Unit reported the city's growth is also supported by its large population; in 2007 its population was 3,471,993. The city also had the highest formal employment percentages of the country (growing from around 14% to just under 18% from 1996-2007) and that these people were predominately employed in the manufacturing, community services, trade, business services and financial services industries. During the period of 2001 – 2008 the Economic Research Unit reported unemployment percentages (in the formal employment sector) for the city of Johannesburg ranged between the low 20's to the high 20's.

The City of Durban is on the east coast of South Africa. It contributed 10.9% of the national economic output (The Department of Economic Development's Economic Research Unit 2009). The port city traditionally is supported by the transportation, trade, finance, manufacturing and community services

industries. Durban, experienced similar high unemployment rates as Johannesburg. According to The Department of Economic Development's Economic Research Unit (2009) unemployment percentages ranged from the mid 20's to low 20's. The report also showed that the Durban area had the highest proportion of people working in the informal employment sector compared to Johannesburg and Cape Town. The city's transport infrastructure comprises of roads for mini bus taxis, meter cabs, buses, trucks and cars. Development in the city over the years has sprawled northwards, as an emphasis on moving away from the inner city has continued for years. Northern areas such as Umhlanga have been developing at rapid pace, for residential and commercial properties.

The commercial office sector was selected as the focus of the study because the sector has an abundance of information for comparison purposes. The literature review for this study guided the choice of using office space. Wheaton (1987), Voith and Crane (1988), Clapp (1993), Mueller and Laposa (1994), Shilton (1998), Gordon, Mosbaugh and Canter (1996), and Wheaton, Torto and Evans (1997) all conducted their studies using office space mostly in metropolitan areas or cities as the main property sector for investigation. Within the office sector investors have the option to use different investment vehicles such as Real Estate Investment Trusts (REITS), Property Loan Stocks (PLS), Property Unit Trusts (PUTs) which focus heavily on the South African commercial property market. Aside from the aforementioned investment vehicles, direct investments purchasing a building or developing a new building) are also a viable option for investors. As South Africa is still an emerging market, it is more appropriate to measure commercial office space because residential property poses an array of difficulties. At the forefront of those difficulties are large townships, rural and informal settlements where data are not easy to collect. The latter environment present challenges relating to property valuations. On the other the industrial market is too small. Thus it will not provide as much value as a study of the commercial office market.

4.3. Year 2001

Since 1994, growth in South Africa, particularly GDP, has been steady. According to the National Planning Commission (Hanival and Maia 2008) since 2004, the GDP growth had grown at an average of 5%. Recently South Africa has seen growth due to strong performance in key sectors such as manufacturing, financial, business services, transport, and property. The property sector also includes accommodation and retail. As South Africa continued to become more connected with the world, there was also a rise in black income levels, which also helped fuel domestic economic growth. The rising black middle class entered the workforce, companies grew and construction and absorption of space increased. According to Venter (2009) in 2001, economic activity was hindered by a minor recession which the US economy just experienced. The recent "dot-com" bubble burst had a negative effect on global investments which affected commodity producing economy of South Africa.

In 2001, the country's office property market was in a recession phase of the property cycle shown through total returns remaining low and the national gross domestic product for the country being 2.7%, was the lowest in the 2001 to 2009 timeframe. South Africa's low GDP was partly attributed to the lack of formal sector employment being added to the market. These were signs that the investment climate in the office market was not favourable at the time. At the time, South Africa had the 2nd lowest GDP of the 5 BRICS[5] nations, while inflation was at 5.7%.

The year 2001 saw Cape Town CBD office capitalisation rates at 14.2%, while Durban CBD office cap rates performed similarly at 14.8%. The Johannesburg CBD office cap rates in 2001 however, were vastly higher at 18.6%.

[5] The BRICS countries have been chosen for comparison, as all five countries are developing nations at similar developmental stage. Also, comparing GDP to other African countries provides skewed results because the majority of African countries are far more underdeveloped than South Africa, hence having a greater chance of rapid growth.

While Johannesburg CBD at the time, had the highest capitalisation rate, it also had the lowest CBD rental per m² at an average of R25/m², compared to Cape Town and Durban CBD's average m²'s of R41/m² and R28/m² respectively. Johannesburg CBD's low rental is partially attributed to Sandton CBD being a much more desirable location for A+, A, B and C grade office space for businesses. During the year 2001, Sandton CBD had an average office rental of R63/m², far surpassing Johannesburg's average CBD office rental. Johannesburg CBD also had the highest vacancy rate, amongst the three cities at 30.8%, while Cape Town CBD and Durban CBD had vacancies of 16.9% and 27.2% respectively.

However, in the decentralised office market, Durban had the highest vacancies at 23.5%, while Cape Town and Durban followed at 18% and 12.3%. Decentralised office cap rates in Johannesburg were the highest of the three chosen cities at 14.1%, while Durban was closely behind at 13.1% and Cape Town at 7%.

Johannesburg CBD produced the highest capital values of R1309 million, while Cape Town CBD and Durban CBD followed at R1120 million and R873 million respectively. The decentralised office market is more closely spread between the three chosen cities with Cape Town at R521 million, Johannesburg at R478 million and Durban at R259 million.

In 2001, Johannesburg had the highest number of CBD office investments of the three chosen cities at 77, compared to Durban CBD's 33, and Cape Town CBD's 25. This is to be expected though as Johannesburg CBD had 1,000,000 m² of gross lettable area in 2001, while Cape Town CBD and Durban CBD both had approximately 400,000 m² of gross lettable area showing that Johannesburg is significantly bigger than both cities in size. Johannesburg decentralised investments experienced similar results with 284 investments compared to Cape Town decentralised 46 and Durban decentralised 20 investments.

Durban CBD had the highest base rental yield at 16.3% of the three chosen cities, and also out performed that national office base rental yield of 13.4%. Johannesburg CBD and Cape Town CBD also outperformed the national office benchmark at 15.7% and 14% respectively. Cape Town (12%), Durban (12.5%) and Johannesburg (8.4%) decentralised, all under-performed against the base rental yield national benchmark.

Only Cape Town CBD of the three chosen cities outperformed the national base rental growth 2.2%. Cape Town CBD's base rental growth rate was 3.7%, while Johannesburg was 0.2%, and Durban was -0.4%. While Cape Town CBD was the only segment to outperform the national base rental growth, none of the three chosen decentralised office segments could outperform the national base rental growth benchmark. In fact, Cape Town decentralised base rental growth performed the most poorly of the three chosen cities at -10.5%, while Durban decentralised also performed poorly at -1.6% and Johannesburg decentralised under-performed at 0.9%.

In 2001, Johannesburg CBD office market experienced an income return of 12.8 outperforming the office national benchmark by 1.8%. Cape Town CBD slightly outperformed the office national income return benchmark by 0.5%, and Durban CBD under-performed against the national income return benchmark by 1.7%. All three chosen decentralised markets under-performed against the national income return benchmark of 11%. Johannesburg decentralised performed the most poorly at 7.9%, while Cape Town and Durban performed at 8.8% and 10.7% respectively.

Cape Town CBD's total return outperformed the national total return benchmark by 2%. The national total return benchmark for 2001 was 7.7%, and Durban CBD greatly under-performed against the benchmark at -7.9%, and Johannesburg CBD slightly under performed against the benchmark at 6.4%. Durban CBD under-performed, however Durban decentralised total return experienced great performance of 15.6% against the national total return benchmark of 7.7%. Johannesburg and Cape Town decentralised performed similarly at 6.6% and 6.4% respectively.

4.4. Year 2002

In 2002, the recession phase of the cycle hit its trough in the office market as the prime-lending rate increased four times, lifting the rate by 400 basis points from the previous year to 16%. In the same year, the country's GDP increased by 1% point from the previous year to 3.7%. The GDP growth increase stems from a combination of the export volumes in South Africa not being drastically effected by the 2001 minor recession in the US economy, and increased consumption from the South African government. South Africa's inflation rate increased by 3.5% points from the previous year, to 9.2% for the year 2002. The opportunities for investment growth were stunted as low GDP growth and higher interest rates hindered economic growth. Off the back of low investment opportunities, the South African government started a radical process of improving tax collection while widening the applicable scope for tax liability. This resulted in the South African government having a larger expenditure budget for government spend.

Johannesburg decentralised continued its trend from the previous year of having the highest cap rates of the three chosen cities at 14.6%. Decentralised cap rates in Johannesburg remained rather flat only growing 0.5% from the previous year. Similar to Johannesburg, Durban and Cape Town decentralised had very little movement, with cap rates at 13.7% (growth of 0.6% points) and 7.7% (growth of 0.7% points) respectively. Johannesburg CBD vacancies saw a rise by 14.6% points to 45.4% as companies were seeking office space elsewhere, while Cape Town CBD vacancies increased by 9.3% points and Durban CBD vacancies declined by 5.8% points to 21.4%.

While Durban CBD vacancies declined, Durban decentralised vacancies declined by 10.3% points to 13.2%. Cape Town decentralised vacancies decreased by 1.2% points to 16.8% from the previous year. Johannesburg decentralised is the only decentralised market of the three chosen cities to follow the national upward trend, seeing its vacancies increase by 2.5% points to 14.8%. All-office vacancy rate across the country increased 5% points from its previous year of 19.4 %, which is a sign of oversupply in the market.

While the national office gross rental receivable increased by 1.2% points from 2001, Johannesburg CBD was the only CBD of the three chosen cities to have declined rentals. Johannesburg CBD rentals declined by R8/m² to R17/m². Durban and Cape Town CBD's both followed the upward trend of the national office gross rental receivable. Durban CBD had the largest increase in rentals out of the three chosen cities of R12/m², which brought its 2002 office rentals up to R40/m². Cape Town CBD's gross rental receivable increased by R2/m² to R44/m².

The upward trend in Cape Town continued as decentralised office rentals increased by R2/m² producing the highest growth of decentralised rentals within the three chosen cities. Durban decentralised rentals increased by R1/m² from the previous year, with 2002 decentralised office rentals at R45/m². Johannesburg decentralised office rentals increased by R1/m², thus having the lowest decentralised rental growth of all three chosen cities from the previous year. All three cities decentralised office rentals followed the national upward trend as national rentals went up by R1/m² on average.

Durban and Johannesburg CBD base rental yield performed in a similar upward trend as the national base rental yield. The national base rental yield grew by 1% point, while Durban CBD's grew by 5% points, Johannesburg CBD's by 0.9% points and Cape Town CBD's base rental yield remained flat at 14.3% from the previous year. All the city's decentralised office markets followed the national upward trend of growth. Following the trend of Durban's CBD, its decentralised market grew (from 12.5%) the most of the three chosen cities from the previous year by 4.2% points. Johannesburg's decentralised office base rental yield grew at the exact same rate as its CBD base rental yield of 0.9% points from 2001. Cape Town's decentralised base rental yield grew by 1.1% points from its previous year.

Cape Town's decentralised experienced the highest base rental growth increased by 18.2% points from the previous year of 2001, compared to Durban's 13.3% points increase and Johannesburg's 0.4% point decline.

However Johannesburg CBD's base rental growth increased by 9.9% points, while Cape Town CBD continued with the downward trend of a 6.3% point decline in base rental growth from the previous year of 2001. Durban CBD was the only CBD of the three chosen cities, which managed to have an increase base rental growth from the previous year by 7.9% points.

Durban CBD was also the one of the three chosen cities to have an increase in income return from the previous year (3.5% points). Johannesburg CBD, Cape Town CBD and national office market all experienced a decline in income return from 2001. The national office market declined in income return from 2001's 11.4% to 10.3% in 2002. The low level of performance was to be expected as the property cycle was still in the Recession phase. Johannesburg CBD's income return declined by 5.5% points from 12.8% to 7.3% from the previous year. Cape Town CBD's income return declined to 7.4% from 11.6% from the previous year, showing a decline of 4.2% points.

The Cape Town decentralised market income return increased to 9.7% from the previous year, 8.3% showing a growth of 1.4% points from 2001. This income return increase stems from the very high base rental growth experienced in Cape Town decentralised markets. Durban decentralised grew by 1% point from the previous year shifting from 1.7% to 11.7%. Johannesburg decentralised income return remained rather flat from the previous year, 7.9% to 7.8% showing the slightest of declines at 0.1% points from the previous year. All three chosen cities outperformed the national income return benchmark of a decline 0.7% point from 2001 to 2002.

The downward trend extended to national total return as the office market experienced a 2.7% point decline in total return. All three chosen CBD's experienced a similar contraction in total return from the previous year. Johannesburg CBD experienced the greatest decline in total return at 9.1% points from the previous year, bringing Johannesburg CBD total return for 2002 down to -2.5%. Cape Town CBD experienced a 3.2% point decline in total return from the previous year, bringing 2002's total return for Cape Town CBD's to 6.5%. Durban CBD had the lowest decline of the three chosen CBD

segments at 1.1% points, bringing the total return for Durban CBD down to -9% from the previous year. Durban decentralised performed the most poorly of the three chosen decentralised markets, as its total return declined by 12.1% from the previous year. Johannesburg's decline continued as its decentralised market declined by 2.5% points from the previous year, bringing its total return for 2002 down to 4.1%. Cape Town decentralised total return remained flat at 6.2% similar to its previous year of 6.4%.

Durban CBD and Johannesburg CBD both experienced a downward trend in capital values from the previous year. Durban CBD saw a decline in capital values of office properties of 27.6%, while Johannesburg CBD experienced a 39.9% decline in office capital values from the previous year. Investors in the Durban area began to focus on developing the decentralised northern suburbs such as Umhlanga where large construction projects like Gateway Shopping Centre which opened in 2001. Developments like Gateway spurred on further development growth in the retail and commercial sectors in the area. However, Cape Town CBD saw an increase in capital values by 25.6% from the previous year. The decentralised office markets of Cape Town, Durban and Johannesburg all experienced a negative performance from the previous year. Cape Town decentralised office capital values decreased by 29.6% from the previous year, while Durban experienced an 8.5% decline within the same time frame. Johannesburg decentralised offices also saw a decrease in capital values of 4.6% from the previous year of 2002.

While there was a large decrease in capital values from the previous year, there was also a decrease in the number of investments in the office market nationally by 43 from the previous year's 664 investments. The decline in office investments by 43 is the highest growth in office investments during the timeframe of 2001 to 2009. Johannesburg CBD and Durban CBD experienced a decline in the number of office investments in the market. Durban CBD experienced the greatest decline in office investments by 10, bringing investments to 23 from the previous year's 33. Johannesburg CBD followed the downward trend by having 69 investments from the previous year's 77, showing a decline of 8 investments. Cape Town CBD was the only one of the

chosen CBD segments to have a growth of investments from 25 to 48 from the previous year. The year 2002 the national office market was in the trough phase of the property cycle and signaled the end of the recession period, which led into the recovery period the following year. The average downward trend across the three chosen cities CBD and decentralised markets in the capital values, number of investments, base rental growth and total return suggest an oversupply of gross lettable area in the office market.

4.5. Year 2003

While 2002 experienced the trough of the property cycle, going into 2003, the market conditions began to improve and show signs of recovery. The decrease in prime-lending rates and inflation were two signs of recovery. The year 2003, was the year the office property market reached the Recovery phase in its cycle. Positive economic activity had a favourable impact on office property in the three chosen cities decentralised and CBD markets. In 2003, the prime-lending rate was 17%, which changed six times within the year. The year 2003 ended with the prime-lending rate at 11.5%. Similar to the prime-lending rate, the GDP growth of the country was on the decline. From the previous year, South Africa's GDP declined by 0.8% points to 2.9%. International economic growth was low, thus lowering the demand for South African exports. During this year the rand also appreciated effecting exports. The manufacturing sector was most impacted by these developments hence GDP growth was hindered. Inflation also experienced a decline of 3.3% points to 5.9% from the previous year. Inflation rates decreasing is a catalyst for economic and investment growth in a country, this is seen through the number of investments growing from the following year.

All three cities CBD's cap rates declined from the previous year. Cape Town CBD experienced the greatest decline of 1.8% points from the previous year, Johannesburg had the second greatest decline of 1.4% points and Durban declined 1% point since 2002. The decentralised office market segments in Cape Town and Durban similar to the CBD's experienced a downward trend, as Cape Town and Durban decentralised both declined by 0.3% point while

Johannesburg decentralised increased by 0.1% point from the previous year. The upward recovery trend continued to be shown through the declining of vacancies.

The national benchmark for office vacancies experienced a decline of 1.6% points from the previous year. Johannesburg and Cape Town CBD's both experienced similar performance to the national benchmark for office vacancies with Johannesburg CBD declining by 4.1% points outperforming the national office vacancy rate, while Cape Town experienced a 3.3% point decline from the previous year. Durban CBD had a decline of only 0.2% point in office vacancies since 2001. However Durban decentralised experienced a greater decline in its decentralised office vacancies by 6.7% points, which outperformed the national office vacancy rate. Cape Town decentralised also outperformed the national office vacancy rate benchmark by declining 5.6% points from the previous year. Johannesburg decentralised went in the opposite direction of the nation's vacancy rate for 2003, and increased by 0.5% points.

While vacancies declined in Durban CBD and Durban decentralised from the previous year, gross rental receivable in Durban CBD also declined from the previous year by R1/m2. Cape Town CBD experienced greater rentals from the previous year as rentals increased by R4/m². Johannesburg CBD experienced growth in gross rental receivable by R3/m² from 2002. Johannesburg decentralised gross rental receivable remained flat at R36/m², the same as the previous year showing no signs of growth. Durban decentralised however, experienced a growth of R5/m² from the previous year, while Cape Town decentralised experienced a growth of R2/m². The national office gross rental receivable benchmark increased by R4/m² from the previous year, thus only the Cape Town CBD and Durban decentralised segment matched or outperformed the benchmark.

Capital values were on the rise during the year 2003, which would mark the beginning seven consecutive years of all-office capital value growth across the country as the market would transition from Recovery to Market Expansion in the property cycle. Cape Town CBD offices saw an increase of 21.7% in capital

values from the previous year, while Durban CBD experienced a 13.6% within the same time frame. Johannesburg CBD saw a 27.1% increase providing the largest increase in capital values from the previous year, of the three chosen CBD's office markets. Cape Town decentralised and Durban decentralised experienced a 50.7% and 36.7% increase respectively in capital values from the previous year, while Johannesburg decentralised saw a 22.8% increase within the same time frame. National all-office capital values increased by 26.9% from the previous year, showing strong growth in South Africa's office sector. Cape Town decentralised at 50.7% and Durban decentralised at 36.7% both outperformed the national growth in office values from the previous year.

Johannesburg CBD was the only chosen market segment to have a decline in the number of office investments from the previous year. Johannesburg CBD's number of investments declined by 10, while Cape Town CBD and Durban CBD both increased by 6 and 7 respectively from the previous year. The decentralised office market across all three chosen decentralised segments experienced an upward trend, seeing Johannesburg decentralised number of investments growing by 89, Cape Town decentralised growing by 18 and Durban decentralised only growing by 3 from the previous year. The national number of office investments was in sync with the three chosen cities as it grew by 280, having 2003 ending with a total of 901 office investments for the year. On average across the three cities CBD and decentralised office markets, there was an increase in the number of investments suggesting that property investors were cautiously testing the market which is a sign of economic and investment growth in the industry.

The national office base rental yield declined by 0.4% points from the previous year of 2002. Cape Town CBD (1.5%), Durban CBD (1.7%) and Johannesburg CBD (2.5%) experienced a similar decline in base rental yield from the previous year. Johannesburg decentralised experienced a significantly smaller decline of 0.1% points from the previous year, while Cape Town decentralised base rental yield declined by 0.2% points and Durban experienced the greatest decline of 2% points. As the national office base rental yield declined by 0.4% points from the previous year, only the Johannesburg decentralised and Cape

Town decentralised segments outperformed the benchmark.

In the year 2003, 4 of the 6 chosen segments experienced a decline in base rental growth, as did the national base rental growth benchmark. Although vacancies were generally decreasing, base rental growth was declining which suggests an over-supply in the market. The improving vacancies were able to make up for the very low base rental growth rates which were experienced in 2003. Cape Town CBD (-2.9%), Durban CBD (-4.0%), Durban decentralised (-2.15%) and Johannesburg decentralised (-2.3%) all experienced a decline of 0.3%, 12.3%, 14% and 2.8% points respectively. Johannesburg CBD experienced an increase in base rental growth by 13.9% points and Cape Town decentralised experienced a growth of 3.6% points from the previous year. The national office base rental growth benchmark declined by 2.3% points from the previous year. Only Johannesburg CBD and Cape Town decentralised outperformed the national base rental growth benchmark in the year 2003.

In 2003, Johannesburg CBD and Cape Town CBD experienced 1.1% point and 1.5% point, respectively, in the growth of income return from the previous year. Durban CBD experienced a 0.5% point decline in income return for the year of 2002. Cape Town's decentralised experienced an income return growth of 0.2% point, while the Durban decentralised segment experienced an income return growth of 0.5% points and Johannesburg decentralised income return grew by 0.3% points from the year 2002. The national income return growth rate grew by 0.6% points from the previous year, meaning Johannesburg CBD, Cape Town CBD matched or outperformed the national income return benchmark growth from the previous year.

All three chosen CBD's total return performed well showing an increase across the board. This increase in total return stems from growth in gross rental receivables seen in 2003. Cape Town CBD showed an increase of 0.5% points from the previous year as the Johannesburg CBD total return also increased by 15.5% points. Durban CBD total return increased by 22.5% points showing the greatest increase in total return from the previous year of all of the three chosen CBD's. Durban decentralised had the highest growth of all of the three

decentralised markets in total return from the previous year at 14.8% points. Johannesburg also experienced a growth in total return of 1.3% points from the previous year. Cape Town decentralised had the smallest growth in total return of only 0.7% points from the previous year. Durban CBD, Johannesburg CBD, and Durban decentralised all managed to outperform the national office total return growth benchmark of 3.9% points for the year of 2003.

4.6. Year 2004

Internationally, the global economy began an upswing, which led to an increase in commodity prices. This increase was beneficial to emerging markets. Manufacturing saw growth which was a major factor in the increase in GDP growth. Domestically, the year 2004 marked the beginning of an infrastructure boom, as the Fédération Internationale de Football Association (FIFA) announced South Africa had won the bid to host the 2010 FIFA World Cup Finals. Various transportation and infrastructure projects were planned, which would have a positive effect on how people moved around cities, which would have a lasting impact on office nodes. As development plans were announced, the country's GDP increased by 1.7% points from the previous, capping off at 4.6% for the year. South Africa had the lowest GDP of the BRICS countries. Inflation decreased dramatically by 4.5% points to 1.4% in the same time frame. The improvement in investment conditions improved as the prime-lending rate decreased to 11%.

Office cap rates began to decline as interest in CBD's increased. Cape Town CBD offices had cap rates of 12.9%, Durban CBD 15.8% and Johannesburg CBD 16.3%. From the previous year the three chosen CBD segments experienced a similar decline in cap rates with Durban CBD having the largest decline at 1.5% points, Johannesburg CBD at 1.4% points and Cape Town CBD at 1.3% points. Cap rates in the decentralised areas of the three chosen cities, experienced similar performance as the CBD markets. All three chosen decentralised segments declined from the previous year. Cape Town decentralised declined (0.4% points) from 7.4% to 7%, Durban decentralised declined (0.6% points) from 13.4% to 12.8% and Johannesburg decentralised

declined by the greatest of the three chosen decentralised markets (1.2% points) from 14.8 to 13.5%.

While in 2004, the majority of office cap rates throughout the three chosen CBD and decentralised markets were decreasing, and so were office vacancies across the board. A decline in cap rates is generally a sign of increased property value. The increase in capital value is also supported by an increase in rental tenants. Cape Town CBD experienced the greatest decline in office vacancies of 13% points from the previous year. Johannesburg CBD and Durban CBD experienced a decline in office vacancies of 4.3% points and 1.8% points respectively. Although Durban CBD experienced the lowest decline in office vacancies from the previous year, Durban decentralised experienced the highest decline in office vacancies of 6.2% points of all three chosen decentralised segments. Cape Town decentralised experienced a 5.6% point decline, while Johannesburg experienced a more modest 1.3% point decline in office vacancies from the previous year. The national office vacancies benchmark declined 5.4% points from the previous year of 2003. Cape Town CBD, Cape Town decentralised and Durban decentralised were the three market segments, which outperformed the national office vacancies benchmark for 2004.

As office vacancies across the board were decreasing, gross rental receivable was increasing across all three chosen CBD and decentralised segments. The combination of factors supports the strengthening of cap rates as they declined. For the foreseeable future, excess stock would be absorbed, as vacancies looked to decrease and gross rental receivable looked to continue to increase. Cape Town in particular experienced a large decrease in vacancies from the previous year, partially due to the fact that the city was implanting its urban regeneration plan with various office buildings being converted into luxury apartment buildings (for example Cartwright's Corner on Adderley street which is a former Old Mutual office block). Johannesburg CBD and Cape Town CBD had the greatest increase in gross rental receivable at R7/m² and R6/m² respectively. The similar performance continued as Cape Town decentralised and Johannesburg decentralised experienced the same increase in gross

rental receivable at R4/m² both significantly higher than Durban decentralised. Durban CBD experienced a growth of R2/m² while Durban decentralised increased by R1/m². The national office vacancy growth from the previous year benchmark was R4/m², and Cape Town CBD, Johannesburg CBD both outperformed the benchmark. Cape Town decentralised and Durban decentralised both matched the benchmark for the year 2004.

The decline in office cap rates signaled the increase in capital values from the previous year. National all-office capital values experienced an increase of 27.3% points since 2003. Cape Town CBD office capital values increased by 38.6% points, outperforming the national growth in capital values benchmark from the previous year. Durban CBD office capital values experienced modest growth of 0.3% points from the previous year, while Johannesburg CBD saw a 3.2% point decline within the same time frame. Cape Town decentralised saw an 8.3% point increase in office capital values from the previous year, while Durban decentralised saw a staggering growth of 87.7% points increase in capital values. Johannesburg decentralised experienced a 26.3% point increase in capital values from the previous year of 2003. Interest rates decreased by 0.5% points from the previous year, creating favourable opportunities to invest.

In 2004, investment conditions improved as well as investor confidence which led to Durban CBD and Johannesburg CBD being the only two of the chosen segments to experience a decrease in the number of investments from the previous year. The strong demand for office investments was partially based on the decline experienced in cap rates in the office sector. The national number of office investments from the previous year experienced a growth of 39, which is the second highest growth experienced during the timeframe of 2001 to 2009. Cape Town CBD, Cape Town decentralised, Durban decentralised, and Johannesburg decentralised all experienced growth in the number of investments from the previous year by 2, 1, 18 and 24 respectively.

2004 was a bad year for base rental yield performance across the board with most of the chosen CBD and decentralised segments having negative growth

from the previous year. Cape Town CBD experienced a base rental yield decline of 1.3% points from the previous year, while Johannesburg CBD experienced a 1.2% point decline in base rental yield from the previous year. Both Cape Town decentralised and Johannesburg decentralised experienced similar declines as their respectively CBD areas as they declined by 0.9% points and 0.4% points respectively. Durban CBD and Durban decentralised both managed to be the only segments to have an increase of base rental yield by 1.4% points and 0.7% points respectively. The national office base rental yield benchmark for 2004 was 13.3% and only Durban CBD and Durban decentralised outperformed the national benchmark for 2004.

The base rental growth experienced an increase across all three chosen CBD segments, however the Cape Town decentralised segment experienced a decline. Out of the three chosen CBD segments, Durban CBD experienced the greatest base rental growth of 10.5% points from the previous year, while Cape Town CBD experienced a base rental growth of 7.1% points. Johannesburg CBD had a modest base rental growth of 2% points from the previous year of 2003. Cape Town decentralised experienced the greatest decline of base rental growth of 13.1% points from the previous year. Durban decentralised, and Johannesburg decentralised experienced base rental growth increases of 0.5% points and 1.1% points respectively. The national office base rental growth rate grew by 1.9% from the previous year, and Durban CBD, Cape Town CBD and Johannesburg CBD outperformed the benchmark growth from the previous year.

Income return for the year 2004 in Cape Town CBD and Durban CBD office market segments grew by 0.7% points and 2.2% points respectively. Johannesburg, however experienced a decline in total return of 2.4% points from the previous year. Cape Town decentralised experienced a 0.3% point decline in income return from the previous year of 2003, and Durban experienced a 0.6% point decline. Johannesburg decentralised income return remained flat at 8% from the previous year showing no signs of growth. The national office income return benchmark for 2004 was 10.7%, and Durban CBD, Durban decentralised were the only two segments to outperform the 2004

benchmark.

Cape Town CBD total return grew 14.1% points from the previous years, 7.1% to 2004's 21.2%. Cape Town CBD was also the only one of the chosen CBD segments to experience a growth in total return from the previous year. Johannesburg CBD experienced the greatest decline of the three chosen CBD segments of 6.7% points from the previous year, while Durban CBD declined 1.6% points in the same time frame. Durban was the only city to experience a decline in total return in its CBD and decentralised areas, as its decentralised area experienced a decline of 9.8% points. Cape Town decentralised experienced an increase of total return by 7.2% points, and Johannesburg had a similar growth in total return of 7% from the previous year of 2003. The national office total return rate grew by 7.6% points from the previous year, meaning only Cape Town CBD was able to outperform the national total return growth rate from the previous year of 2003.

The growth in total return coupled with increasing number of investments, decreasing vacancies and an increase in gross rentals receivable suggests that investors were confident in the growth experienced in the market and that they believed it would continue. The similar performances across all three CBD and decentralised areas also provided stability and confidence for investors looking for similar performance across different locations within the same investment classes. The end of 2004 saw the transition from the Recovery phase to the Market Expansion phase of the property cycle in the office market.

4.7. Year 2005

The year 2005 marked the beginning of the Market Expansion phase in the office market property cycle, which would continue for approximately another two and a half years. The year 2005 only saw one prime-lending rate change, which was a decrease of 50 basis points to 10.5%. Interest rates declining provided more favourable financial terms for property investors. The countries GDP growth increased by 0.7% points from the previous year to 5.3%. Again South Africa had low GDP growth as the country had the second lowest growth

in GDP of the BRICS nations. The inflation rate of the South Africa was the second lowest growth of the BRICS countries, and experienced an inflation rate that of a first-world developed country at 3.4%.

2005 saw Cape Town CBD, Durban CBD and Johannesburg CBD's office cap rates decrease from the previous year. As cap rates diminished, prime interest rates declined to 10.5%, creating favourable opportunities for investments. Durban CBD's office cap rates had the greatest decline of all three chosen CBD markets of 3.4% points from 2004's 15.8% to 12.4%. Cape Town CBD experienced a 2.2% point decline office cap rates from the previous year's 12.9% to 10.7%. Johannesburg CBD's office cap rates also declined 3% points from the previous years, 16.3% to 13.3%. The decentralised office market in Cape Town experienced the greatest decline of 1.7% points from the previous year, Johannesburg decentralised waned by 1.6% points and Durban decentralised declined by 1.4% points from the previous year.

While office cap rates in the three CBD and decentralised market segments were declining, and so were the office vacancies. This was a positive sign for the increase in capital values thus improving investor confidence. Johannesburg CBD office vacancies declined 13.5% points, which was the greatest decline of the 3 chosen CBD and decentralised markets in this study from the previous year. Cape Town CBD vacancies diminished by 3.9% points from the previous year, and Durban CBD vacancies declined by 1% point. In the decentralised office market Cape Town experienced the greatest decline of 9.2% points from the previous year of the three chosen decentralised markets. Durban decentralised and Johannesburg decentralised both declined by a rate of 2.7% points from the previous year. The national all-office vacancy rate declined by 6.2% points from the previous year of 2004. Johannesburg CBD and Cape Town decentralised both outperformed the national office vacancy rate as both market segments had significantly higher declines in vacancies from the previous year. Vacancies continuing to drop had an impact on gross rental receivables in CBD and decentralised areas, as increases appeared across the board.

Since 2001, gross rental receivable on average had been on the rise, and that did not stop in 2005. Cape Town CBD experienced the highest growth in gross rental receivable of the three chosen CBD markets at R18/m² from the previous year. Johannesburg CBD offices saw the gross rental receivable hike up by R15/m² from the previous year, while Durban CBD saw an escalation in gross rental receivable by R1/m². While Durban had the lowest increase in gross rental receivable from the previous year in the CBD market, it had the highest in the decentralised market at R13/m². Cape Town decentralised experienced an R8/m² growth in gross rental receivable from the previous year, and Johannesburg saw a R6/m² growth during the same time period.

Cape Town's capital values in the office market continued its trend of increasing from the previous years. Cape Town CBD offices experienced a 30.6% increase in capital values from the previous year, while the Cape Town decentralised office market saw a 6.7% point increase within the same time frame. Durban CBD and Johannesburg CBD office markets experienced a 17.5% points and 4.7% points increase respectively in capital values. The decentralised office market capital values continued to increase from the previous year. Durban decentralised offices saw a 26.3% point in capital values from the previous year, while Johannesburg decentralised saw an 11.9% point increase within the same time frame. Interest rates were at 10.5%, which is a decrease of 0.5% points from the previous year. However, interest rates looked set to increase. National all-office capital values increased by 13.5% points from the previous year, thus Cape Town CBD and Durban decentralised both outperformed the national growth in capital values from the previous year benchmark.

The number of investments in Cape Town CBD grew by 1 from the previous year. Durban CBD and Johannesburg experienced a decline of 3 and 9 respectively in the number of investments from the previous year. Cape Town decentralised offices saw a decline of investments by 5 from the previous year, while Durban decentralised remained flat at 41 investments for the year. The Johannesburg decentralised office market experienced a decline of 31 investments from the previous year of 2004. The number of investments

nationally decreased by 77 from the previous year.

In the year 2005 base rental yield in the office sector took a dive. Durban CBD offices had the greatest decline of 4% points in base rental yield from the previous year, while Cape Town CBD experienced a 1.7% point and Johannesburg CBD a 0.5% point decline. Durban CBD declined in tandem with Durban decentralised, which experienced the greatest decline of 3.3%, the three chosen decentralised markets. Cape Town decentralised saw a decline of 1% point from the previous year, while Johannesburg experienced a 0.8% point decline from the previous year. The national base rental yield for office space declined by 1.4% points from the previous year, and Johannesburg decentralised, Cape Town decentralised and Johannesburg CBD had less of a decline from the previous year, hence outperforming the national base rental yield growth benchmark. Only Durban CBD at 16.9%, and Johannesburg decentralised at 12.4% outperformed 2005 all-office national base rental yield benchmark of 11.9%.

The base rental growth experienced mixed results for the year of 2005. Of the three chosen CBD segments, Cape Town CBD experienced the greatest and only increase in base rental growth of 11.8% points from the previous year, while both Durban CBD and Johannesburg CBD saw a decline of 11.9% points and 0.1% points from the previous year. Fortunately the decline in base rental growth was accompanied by declining vacancies. It must be noted that while Cape Town CBD experienced a tremendous growth in a base rental year from the previous year, it also started from a lower base than other cities. While Cape Town CBD saw an increase in base rental growth from the previous year, Cape Town decentralised experienced a decline of 0.7% points. Johannesburg decentralised and Durban decentralised saw an opposite performance from their CBD segments as they increased by 3.5% points and 7.5% points respectively. From the previous year all-office base rental growth increased by 1.5% points, and Cape Town CBD, Durban decentralised and Johannesburg decentralised all saw higher growth in base rental growth during the same time frame. Cape Town CBD at 16%, Johannesburg CBD at 5.4%, Johannesburg

decentralised at 5.8% all outperformed the national office base rental growth in 2005 as it was at 5.4%.

Income return in 2005 from the previous year saw mostly a negative performance across the three chosen CBD and decentralised segments from the previous year. Durban CBD, Durban decentralised and Johannesburg decentralised income return experienced the greatest decline of 1.3% points, 4% points and 4% points respectively from the previous year. Cape Town CBD income return also saw a decline of 0.7% points from the previous year of 2004. Only Johannesburg CBD and Cape Town decentralised saw an increase in income return from the previous year showing signs of growth by 5% and 1.3% points respectively. The national income return for office space, increased by 0.1% points from the previous year, and only Cape Town decentralised and Johannesburg CBD outperformed the growth of the national income return for office space from the previous year. During the same year of 2005, Cape Town decentralised, Johannesburg CBD and Johannesburg decentralised at 11.1%, 10.9% and 11.2% outperformed the national income return benchmark of 10.8% for the year.

While income return took a dive across various sectors in the year of 2005, total return saw drastic growth across all three cities and decentralised areas. In 2005, the national all-office total return increased by 8.6% points from the previous year, and at 25.1% the national all-office total return rate was at its highest it's been for the past five years. Of all of the chosen market sectors, Durban saw the highest total return from the previous year in its CBD and decentralised areas. Durban CBD experienced an increase in total return of 11.4% points and Durban decentralised saw an increase of 24.7% points from the previous year. Cape Town CBD and Johannesburg CBD total return saw a similar increase of 10.6% and 10% points respectively from the previous year. Cape Town decentralised saw a lower (4.2% point) increase in total return from the previous year than Johannesburg decentralised (5.3% point). All three chosen CBD markets, and Durban decentralised had a higher increase in total return growth from the previous year than the national all-office total return growth.

Economic and property performance as a whole over the three cities CBD and decentralised areas suggests that investors could be confident in in making investments across the different cities. Gross rentals receivables, total return, as well as capital values all increased across the board during the year 2005. This performance signals investors who got in early in the Recovery phase were experiencing solid growth and returns on their investment portfolios.

4.8. Year 2006

The year 2006 saw South Africa's GDP increase by only 0.3% points from the previous year to 5.6%. For the second consecutive year, the country's GDP was the second lowest of all the BRICS nations. A similar performance in inflation was measured in South Africa, as the inflation rate increased by 1.2% points from the previous year to 4.6%; while still being the second lowest inflation rate of all the BRICS countries. During 2006, the SARB announced four prime-lending rate changes, which resulted in prime-lending rates capping off at 12.5% for the year.

Since 2003, office CBD cap rates have been on the decline in Cape Town, Durban and Johannesburg. The decline continued from 2005 into 2006. Cape Town at 9.9%, Durban, at 12% and Johannesburg at 12.2% saw the lowest the three CBD cap rates had been since 2002. Cape Town decentralised was the only one of the chosen sectors to experience a growth (of 4.5% points) in cap rates from the previous year. Durban decentralised and Johannesburg decentralised offices both experienced a decline in cap rates by 0.7% points and 0.4% points respectively.

Vacancies on the whole in 2006, were steadily on the decline since 2004 except for Cape Town CBD, which experienced a growth in office vacancies by 0.5% points. Durban CBD and Johannesburg CBD both experienced their lowest office vacancies since 2002 at 15% and 11% respectively. Although Cape Town saw an increase in its vacancies by 0.5% points from the previous year, at 6.5% Cape Town CBD vacancies were still lower than the 2005 national

vacancy rate of 7.9%. Johannesburg CBD saw the largest decline in vacancies of 12.8% points from the previous year of 2004 of all three CBD and decentralised market segments helped by the conversion of offices into student accommodation by private companies such as Southpoint. Durban CBD and Durban decentralised saw a decline in office vacancies of 3.5% points and 1% point respectively from the year 2004. Cape Town decentralised and Johannesburg decentralised also had positive performances seeing declines of 1.3% points and 4.6% points respectively in office vacancies from the previous year. The national office vacancy rate declined by 3.3% points from the previous year, and Durban CBD, Johannesburg CBD, and Johannesburg decentralised declined at a greater rate from the previous year.

In 2006, all-office gross rent receivable continued to escalate as they have done since 2004. Declining by R4/m² Cape Town CBD office gross rent receivable was the only CBD of the chosen CBD's to experience a decline from the previous year. The decline in gross rental receivable suggests that as new investments were made in Cape Town CBD, market rentals adjusted. This also suggests that it was a tenant market and landlords were forced to negotiate on rental prices. Durban CBD gross rental receivable increased by R2/m² from the previous year, while Johannesburg CBD experienced the greatest increase of the three chosen CBD's and decentralised areas with an R13/m² increase during the same time frame. Cape Town decentralised gross rent receivable increased by R7/m², while Durban decentralised and Johannesburg decentralised saw an R6/m² and R4/m² increase respectively from the previous year. At R61/m² the national all-office gross rentals receivable had reached its peak for the past 5 years, and looked to continue increasing over the coming years. During this peak, Cape Town CBD at R68/m² and Durban decentralised at R70/m² were the only two segments to outperform the national all-office gross rent receivable benchmark.

Similar to office gross rentals receivable, office capital values continued to increase from the previous year. For the fourth consecutive year, national all-office capital values increased from the previous year. In 2006, national all-office capital values increased by 12.7% points from the previous year of 2005.

Johannesburg CBD office capital values had a similar experience as it saw an increase of 6.4% points, while Johannesburg decentralised saw a 13.4% point increase within the same period. Cape Town decentralised and Durban decentralised office markets both experienced a 36.6% point and 27.9% point increase in capital values respectively from the previous year. However, Cape Town CBD and Durban CBD office markets both experienced a decline by 25.1% points and 18.2% points from the previous year. Cape Town decentralised and Durban decentralised both managed to outperform the national all-office growth in capital values from the previous year benchmark.

While gross rental receivable and capital values were on the increase, the number of office investments from the previous year was on the decline. 2006 saw a decline of 89 investments from the previous year, which was the largest decline in office investments across the country from a previous year during the entire period of 2001 to 2009. The decline in office investments seems to stem from Eskom's temporary suspension on electricity certificates for new developments. The only market segment, which experienced any growth in office investments from the previous year, was Cape Town decentralised with a growth of 13 investments. Cape Town CBD, Durban CBD and Johannesburg CBD all experienced a decline of 23, 7 and 11 respectively. The decentralised office sector saw a similar performance in Durban and Johannesburg all experiencing a decline of 1 and 53 office investments respectively from the previous year. On average the decrease in the number of office investments, coupled with the increase in gross rental receivable and capital values signifies that the office market began to have an over-supply of gross lettable area.

The majority of the three chosen CBD sectors experienced a decline in office base rental yields from the previous year. Cape Town CBD saw an increase of 0.4% points in base rental yields while Durban CBD and Johannesburg CBD both saw a decline of 4% points and 1.6% points respectively from the previous year. A similar performance was experienced in the decentralised markets of Cape Town, Durban and Johannesburg. Cape Town decentralised saw a decline of 0.9% points, while Durban and Johannesburg decentralised both experienced a decline of 1.6% points and 0.5% points respectively from the

previous year. The all-office national base rental yield rate was 10.9% for the year 2005. Durban CBD at 12.9% and Durban decentralised at 11.2% were the only two selected market segments to outperform the all-office national base rental yield benchmark for the year.

Contrary to the decline in base rental yields in the year of 2006, the all-office base rental growth increased to 6.9% from the previous year. Cape Town CBD base rental growth saw a decline of 5.3% points from the previous year to 10.7%, which still outperformed the national office base rental growth rate for the year. Durban CBD saw an 11.3% point increase in base rental growth from the previous year, yet failed to outperform the office national benchmark. Johannesburg CBD base rental growth saw an increase of 1.5% points from the previous year to 6.9%, which outperformed the national office base rental growth benchmark. Cape Town decentralised and Johannesburg decentralised both saw an increase in base rental growth from the previous year, but both cities at 5.4% and 5.1% did not outperform the national office base rental growth benchmark. Durban decentralised saw an increase of 0.8% points from the previous year to 7.9%, which outperformed the national base rental growth rate for the year 2006. The combination of low movement of base rental yields and increase in base rental growth lead to the increase in capital value seen in 2006.

Income return in 2006 took a dive across the chosen sectors and country, which marked the beginning of a decline, which lasted for the next two years. Cape Town CBD saw a small decline in income return of 0.1% points from the previous year, while Durban CBD experienced a decline of 3.7% points from the previous year. Johannesburg CBD income return saw a decline of 0.2% points from the previous year, Johannesburg decentralised remained flat showing no signs of growth or decline. Cape Town decentralised experienced a 1.7% point decline in income return from the previous year, while Durban decentralised saw a 1.1% point decline within the same period. With the national income return rate at 10.3%, Johannesburg CBD at 10.9% outperformed the benchmark while Durban decentralised matched the all-office benchmark performance for the year.

While income return in 2006, mostly saw a decline in various sectors, total return experienced better performance based on growth in certain sectors. Durban CBD total return saw growth of 2.5% points from the previous year to 25.8%. Johannesburg CBD had a similar total return to Durban CBD for 2006 at 25.3%, which is a 9.3% point increase from the previous year. Cape Town decentralised experienced a decline of 4.1% points from the previous year's 27.9%. Durban decentralised and Johannesburg decentralised both experienced a growth by 3.3% points and 3.6% points respectively in income return from the previous year. The national all-office total return rate increased by 0.1% points to 25.2% for the year 2006. Durban CBD, Johannesburg CBD, and Durban decentralised had higher total return rates than the national all-office total return rate for 2006.

4.9. Year 2007

The year 2007, South Africa saw another decrease in GDP growth by 0.1% points from the previous year to 5.5%. The decline in the country's GDP growth resulted in South Africa having the lowest GDP growth of all the developing BRICS nations. Inflation also increased by 2.5% points from the previous year to 7.1%. South Africa's inflation was only second to Russia (9%) of the BRICS countries. The sub-prime credit crisis exposed the problems of extending credit to non-credit worthy individuals and institutions. Subsequently, access to debt and equity became difficult as financial institutions appetite for risk contracted severely. Hence it came as no surprise that during the year 2007, the prime-lending rate of South Africa increased four times to 14.5%. The increase in prime-lending rates came off the back of the global credit crisis from the United States housing crash, which peaked in 2006. Financial institutions were tightening up the reins on investment opportunities. The effects of the credit crunch were experienced through declines in national total returns. However as the FIFA 2010 World Cup preparations continued developing, capital values and gross rental income increased as major capital investment projects were still underway which offset some of the effects of the declining total returns.

Durban CBD cap rates experienced an increase by 0.2% points from the previous year, while Cape Town CBD and Johannesburg CBD cap rates saw a decline of 0.7% points and 2.9% points during the same period. Decentralised office cap rates experienced a decline across all three cities from the previous year. Cape Town decentralised office cap rates experienced a decline of 0.4% points from the previous year of 2006. Durban decentralised office cap rates also saw a decline of 0.3% points, while Johannesburg experienced the greatest decline of the three chosen decentralised cities by 1.6% points from the previous year.

The all-office vacancy rate in South Africa was on the decline for the fifth year in a row, and saw a decline of 1.5% points from the previous year. Durban CBD and Cape Town decentralised were the two chosen market segments that increased vacancy rates from the previous year. Durban CBD vacancy rates increased by 5.3% points from 2006, while Cape Town decentralised office vacancy rates increased by 0.7% points within the same period. Cape Town decentralised office vacancy rates declined by 0.6% points from the previous year's 6.4% to 5.8%. Johannesburg CBD office vacancies declined by 3.2% points from 11% in 2006 to 7.8% in 2007. Durban decentralised office vacancies decreased by 1.1% points from the previous years, 3.3% to 2.2%, while Johannesburg decentralised also experienced a decrease in office vacancies by 1.3% points from 6.2% to 4.9% during the same period. Johannesburg CBD vacancies were declining at a greater rate than the national all-office vacancy rate, but at 7.8%, Johannesburg could not outperform the national all-office vacancy rate. Cape Town CBD at 5.8%, Cape Town decentralised at 3.8%, Durban decentralised at 2.2% and Johannesburg decentralised at 4.9% were the market segments to outperform the national all-office vacancy rate for 2007. Consistently declining vacancy rates coupled with high replacement costs suggest that gross rental receivable would continue to experience strong growth.

Gross rental receivable across the country continued to experience an upswing. Since 2001, the national all-office gross rentals receivable has been on the incline showing tremendous growth. From the previous year of 2006, the

national all-office gross rentals receivable increased by R11/m². Cape Town CBD offices saw an R6/m² increase from the previous year, while Durban CBD experienced an R3/m² increase within the same time frame. Johannesburg CBD offices also saw growth in gross rentals receivable of R8/m² achieving the greatest increase in gross rentals receivable of the three chosen CBD markets from the previous year. CBD rental increases were partially attributed to the lack of new developments from the previous year coupled with increased demand. Decentralised office space also continued to experience a boom as Cape Town decentralised saw an R7/m² increase in gross rentals receivable from the previous year, while Durban decentralised achieved the greatest incline in gross rental receivables of the three chosen decentralised markets with an R11/m² increase from 2006. Johannesburg decentralised office gross rentals receivable increased by R8/m² from the previous year. In 2007, Durban decentralised office gross rentals receivable was the highest of the chosen CBD and decentralised markets at R81/m². For the seventh consecutive year Cape Town CBD gross rentals receivable were higher than the national all-office gross rentals receivable per square meter.

Off the back of continued growth in office gross rentals receivable, office capital values continued to increase. National all-office growth in capital values from the previous year was at 16.7%. This marked a period of success for investors which was underpinned by the combination of declining vacancy rates, increasing capital values and increasing in gross rentals receivable over the past few years. Cape Town CBD offices experienced an upswing of 23.9% in capital values, after having a negative performance the previous year. Durban CBD office capital values had a similar to upswing performance to Cape Town CBD, as capital values saw a 0.7% point from the previous year. Johannesburg CBD continued its strong performance of growth in office capital values as it experienced at 41.4%. All three chosen decentralised markets continued to experience an upswing in office capital values. Cape Town decentralised and Durban decentralised offices both saw a 45.2% and 20.9% increase respectively in capital values from the previous year. Johannesburg decentralised offices experienced a 13.4% point increase in capital values from the previous year. Cape Town CBD, Johannesburg CBD, Cape Town

decentralised and Durban decentralised all outperformed the national all-office growth in capital values from the previous year benchmark.

The number of investments from the previous year in the three chosen CBD markets experienced a decline for the second consecutive year. Cape Town CBD, Durban CBD and Johannesburg CBD all saw a decline of 2 office investments from the previous year. Cape Town decentralised still experiencing the boom of high rentals and low vacancies from the previous year, saw an increase in office investments by 6 from the previous year as investors looked to maximise their return. Durban decentralised office investments remained flat at 40 from the previous year, and did not show any signs of growth or decline. Johannesburg decentralised saw a decline of 83 office investments from the previous year. The all national all-office number of investments decreased by 83 from the previous year, which is the second largest decline (after 89 from 2005 to 2006) in office space investments from a previous year during the entire timeframe of 2001 to 2009.

Base rental yield in the South African office market was on the decline for the fourth year in a row. The national all-office base rental yield rate had dropped to 9.8%, which was at its lowest in the timeframe of 2001 to 2009. Cape Town CBD base rental yield was still experiencing growth, and grew by 0.4% points from the previous year. Durban CBD's base rental yield was still enjoying the benefits of declining number of office investments and growth in gross rentals receivable resulting in base rental yield growing by 0.2% points. Johannesburg CBD saw a decrease of 1.2% points in base rental yield from the previous year. Cape Town decentralised offices experienced a decline of 0.5% points in base rental yield from the previous year, while Durban decentralised also saw a decrease of 1.2% points. Johannesburg decentralised experienced a decline of 0.4% points from the previous year. The national all-office base rental yield was 9.8% for the year 2007, and only Durban CBD (13.1%) and Durban decentralised (10%) of the three chosen CBD and decentralised markets outperformed the national benchmark for the year.

The national all-office base rental growth rate grew by 7.1% points from 6.9%

to 14% from the previous year. Cape Town CBD and Durban CBD office base rental growth experienced an increase of 8.4% points and 8.6% respectively from the previous year, while Johannesburg CBD offices saw an increase of 1.9% points during the same time frame. Cape Town decentralised office base rental growth experienced an increase of 1.9% points, while Johannesburg decentralised saw an increase of 3.8%. Cape Town decentralised, is the only one of the chosen CBD and decentralised areas to experience a decrease (of 0.8% points) in base rental growth from the previous year. Cape Town CBD topped the three chosen CBD and decentralised areas in base rental growth for the year 2007 at 19.1% outperforming the national all-office base rental growth rate by 5.1%. Durban CBD office base rental growth of 14.5% was also higher than the national all-office base rental growth benchmark of 14.0%.

The all-office national income return rate declined for the second consecutive year. Cape Town CBD office income return remained flat from the previous year at 8.8%. Durban CBD office income return declined by 0.7% points from the previous year, while Johannesburg CBD saw a 0.5% point decline in the same time frame. Cape Town decentralised was the only one of the three chosen CBD and decentralised areas to experience a growth (by 0.4% points) in income return for the previous year. Johannesburg decentralised offices experienced a 1.1% point decrease in income return from the previous year, while Durban decentralised saw a 0.5% point decrease. The national all-office income return rate declined by 0.7% points from 2006's 10.3% to 2007's 9.6%. Johannesburg CBD at 10.4% was the only one of the chosen CBD and decentralised areas to outperform the national all-office income return rate of 2007.

Cape Town CBD saw an increase of 3.3% points in total return for the previous year, while Durban CBD experienced the largest increase of the three chosen CBD and decentralised office areas of 28.9% points from the previous year. Durban CBD saw the only decrease at 0.9% points in total return for the previous year. Cape Town decentralised office total return remained flat at 23.7% from the previous year. Durban decentralised offices experienced a decline in total return 3.6% points from the previous year, while Johannesburg

decentralised experienced an increase of 4.7% points during the same period. Durban CBD at 54.8% was the only one of the chosen CBD and decentralised areas to outperform the 2007 national all-office total return rate at 30.5%.

The year 2007 signaled the peak of the property cycle, as well as its imminent decline, as the good times were over. Gross rentals receivable, vacancies capital values, base rental growth and total return on average were all continuing to increase or remaining flat, however this was coupled by declines in the number of investments, base rental yield as well as income return across the three cities CBD and decentralised markets. This performance suggests that investors would slow down and wait for the market to turn again as there was clearly an over-supply in the market of office space.

4.10. Year 2008

The year 2008 was the beginning of the downward spiral which is the Market Contraction phase of the property cycle. During the year 2008, South Africa's GDP growth declined 1.9% points from the previous year to 3.6%. For the second consecutive year South Africa had the lowest GDP growth of the BRICS nations. South Africa's GDP growth was suffering partly due to inconsistent electricity supply; which had a major impact on the manufacturing and mining industry. Both sectors are significant contributors to the economy through tax income and sustainable employment creation. During the same year the prime-lending rate experienced three changes, resulting in the prime-lending rate capping off at 15%. Inflation in South Africa grew by 4.4% points from the previous years, 7.1% to 11.5%, which was the second highest inflation rate of the BRICS nations for the year 2008.

Office cap rates across the three chosen CBD and decentralised areas saw an increase from the previous year. Cape Town CBD office cap rates experienced a 1.1% point increase from the previous year, while Durban CBD office cap rates saw a 0.6% point increase within the same period. Johannesburg experienced a 3.7% point increase, which was the largest increase in cap rates from the previous year, of all of the three chosen CBD and decentralised areas.

In 2008, Cape Town decentralised office cap rates reached their all-time peak within the past seven years. Since 2002, this has been the first time decentralised office cap rates for Cape Town, Durban and Johannesburg all increased from the previous year. Cape Town decentralised cap rates increased by 1.1% points from the previous year, while Durban decentralised cap rates saw an increase of 0.8% within the same period. Johannesburg decentralised also experienced an increase in office cap rates of 1.1% points from the previous year of 2007.

Cape Town CBD office vacancies experienced an incline of 0.4% points from the previous year, which was the only one of the three chosen CBD markets to experience an increase in vacancies from the previous year of 2007. Durban CBD and Johannesburg CBD both experienced decreases in vacancies from the previous year of 4.7% and 1.6% respectively. Cape Town decentralised office was also the only decentralised market to experience an increase in vacancies from the previous year of 2007. Cape Town decentralised office vacancies increased by 0.5% from the previous year. The decentralised Johannesburg offices experienced a decline of 0.2% points, while Durban decentralised remained flat at 2.2% from the previous year. The national all-office vacancy rate increased by 0.6% points from the year 2007 to 7%. Johannesburg decentralised at 6.2%, Cape Town decentralised at 6.2%, Durban decentralised at 2.2%, Cape Town CBD at 6.2% and Johannesburg CBD at 6.2% all outperformed the national office vacancy rate of 7% in 2008.

Cape Town CBD was the only one of the three chosen CBD and decentralised areas to experience a decline in gross rentals receivable from the previous year. Cape Town CBD saw a decline of R2/m². The growth in gross rentals receivable seems to be attributed to South Africa entering an upswing in the business cycle. The upswing should translate into strong rental growth in the future. The CBD offices of Johannesburg and Durban, both experienced very strong growth of R8/m² and R27/m² respectively from the previous year. The growth of gross rentals receivable continued in Cape Town decentralised for every single consecutive year since 2001. Since the previous year of 2007,

gross rentals receivable in Cape Town have increased by R14/m². Durban and Johannesburg decentralised offices both experienced an R9/m² increase in gross rentals receivable from the previous year. At R77/m², the national all-office gross rentals receivable increased by R5/m² from the previous year. Durban CBD offices experienced the greatest increase in gross rentals receivable from the previous year, outperforming the national all-office gross rentals receivable growth by R22/m². In the year 2008, only Johannesburg CBD at R89/m², and Durban decentralised at R90/m² outperformed the national all-office gross rentals receivable of R77/m².

Office capital values in South Africa were again on the rise across South Africa. Cape Town CBD office capital values increased by 5.6% points from the previous year; while Johannesburg CBD continued its upswing and increased by 50.2% points within the same time frame. While Johannesburg CBD offices saw an increase, Johannesburg decentralised experienced a decline of 2.6% points from the previous year. Durban CBD also saw a large increase in capital values of 34.8% points from the previous year. Durban's upswing in capital values extended beyond the CBD as decentralised areas experienced a gain of 29.9% points from the previous year. In the same period, Cape Town decentralised offices saw a 10.9% point increase in capital values. Johannesburg CBD, Durban CBD, Durban decentralised and Cape Town decentralised all outperformed the national all-office growth in capital values from the previous year benchmark.

Cape Town and Durban CBD's number of office investments remained flat at 32 and 16 respectively from the previous year. The energy crisis created load-shedding across the country seems to have had a negative effect on new developments entering the market. Demand began to slow down as new office investments were stagnate and few increases were recorded. Johannesburg CBD experienced an incline in the number of office investments from the previous year. Johannesburg decentralised experienced an opposite performance from its CBD, as the number of office investments declined by 14 from the previous year. Cape Town decentralised saw a decline of 1 office investment from the previous year of 2007, while Durban decentralised saw the

office investments increase by 3 within the same period. The national all-office number of investments decreased by 12 from the previous year, which is the lowest decline experienced from a previous year within the entire timeframe of 2001 to 2009.

2008 saw Cape Town CBD office base rental yield decline by 0.3% points from 2007's 9.7%. The Durban CBD offices experienced a similar performance as Cape Town CBD, as base rental yields in Durban CBD declined by 2% points from the previous year. Johannesburg CBD was the only one of the three chosen CBD's to experience a growth in base rental yields, increasing by 4.4% points from the previous year. Cape Town decentralised base rental yield continued to experience a decline since 2005, with base rental yields decreasing by 0.3% points from the previous year. Durban decentralised saw an incline in base rental yield of 1.2% points from the previous year, while Johannesburg decentralised experienced an incline of 0.3% points within the same period. The national all-office base rental yield grew by 0.6% points to 10.4% from the previous year. Durban CBD, Johannesburg CBD, and Durban decentralised are the three market segments, which outperformed the national all-office base rental yield for the year 2008.

The national all-office base rental growth rate inclined by 1.6% points from the previous years, 14% to 15.6% in 2008. The majority of the chosen CBD market's base rental growth declined from the previous year, however Johannesburg CBD experienced tremendous base rental growth of 61.8% points from the previous year's 11.3% to 2008's 73.1%. Cape Town and Johannesburg CBD's base rental growth both experienced a decline of 11.4% points and 2.6% points respectively from the previous year. Cape Town and Durban decentralised experienced a 14.6% point and 2% point incline in base rental growth respectively from the previous year of 2007, while Johannesburg decentralised saw a decline of 1.3% points within the same time frame. Johannesburg CBD at 73.1% and Cape Town decentralised at 21.9% were the only two markets of the three chosen CBD and decentralised markets, which outperformed the national, all-office base rental growth of 15.6% for the year 2008.

The majority of office income return across the country of South Africa experienced a decline. Cape Town and Durban CBD both were the only CBD markets to experience a growth of 1.8% points and 4.2% points respectively from the previous year. Durban CBD income return remained flat at 8.9% from the previous year 2007. Durban decentralised experienced an incline in income return by 0.4% points from the previous year. Cape Town and Durban decentralised both experienced a 1.3% point and 0.6% point decline in income return from the year 2007. The national all-office income return rate declined by 0.4% points from the previous year's 9.6% to 2008's 9.2%. Johannesburg CBD and Durban decentralised at 9.6% are the only two of the chosen CBD and decentralised markets to outperform the national all-office income return benchmark for 2008. The market was in oversupply shown by demand peaking, and total return completely plummets across the CBD and decentralised areas.

A decline in total return was the predominant performance across the country's office markets in 2008. This decline suggests that the market is contracting heading towards another Recession phase of the property cycle. The national all-office total return rate declined extensively by 16.8% points from the previous year's 30.5% to 2008's 13.7%. Cape Town CBD's office income return also saw a tremendous decline of 18.2% points from the previous year, while Durban CBD experienced a 42.9% decline in income return. However, Johannesburg CBD office total return was on the incline by 1.7% points from the previous year. The three chosen decentralised markets all experienced a decline in total return from the previous year. Cape Town decentralised offices saw a 9% point decrease in total return from the previous year, while Durban decentralised experienced a decline of 12.1% points within the same period. Johannesburg decentralised saw a greater decline of 17% from the previous year of 2007. Johannesburg CBD at 26.1%, Cape Town decentralised at 14.7% and Durban decentralised at 14.2% are the only three CBD and decentralised markets, which outperformed the 2008 national all-office total return benchmark of 13.7%. The combination of slowed new investments, total return and gross rentals receivable still remaining relatively high is a clear

indication of an oversupply in the market. At this point, an investor's decision to have invested in any of the three cities CBD and decentralised office markets would have resulted in a similar negative performance.

4.11. Year 2009

In the year 2009, South Africa's GDP declined dramatically to -1.5%. The country was still clearly feeling the effects of the sharp economic decline from the previous year. South Africa's inflation rate was at 7.1%, which was a 4.4% point decline from the previous year of 11.5%. During 2009, the prime-lending rate of South Africa changed four times, resulting in the prime-lending rate capping off at 10.5% for the year.

Cape Town CBD office cap rates experienced a small incline of 0.2% points from the previous year. Durban CBD offices saw a 0.2% point decline in cap rates since 2008. Johannesburg CBD offices experienced a growth of 0.5% points in cap rates from the previous year, while Johannesburg decentralised offices saw a decline in office cap rates of 0.5% points within the same time frame. Durban decentralised also experienced a 0.2% point decline in office cap rates from the previous year, while Cape Town decentralised was the only one of the three chosen decentralised areas to experience an incline (of 0.3% points) within the same period.

2009 saw an increase in the national all-office vacancy rate of 3% points from the previous year. Cape Town CBD offices experienced a 7.8% point increase in vacancies, while Johannesburg CBD offices saw a 5.6% point incline within the same time frame. The Durban CBD office segment was the only one of the three chosen CBD markets to experience a decline in vacancies (by 0.7% points) from the previous year of 2008. Cape Town decentralised experienced a growth in vacancies by 3.3% points from the previous year, while Durban decentralised offices saw a 2.8% point incline in vacancies within the same time frame. Johannesburg decentralised office vacancies saw an incline of 2% points from the year 2008. Durban decentralised at 5%, Johannesburg decentralised at 6.7%, and Cape Town decentralised at 7.6% all had office

vacancies, lower than the national all-office vacancy rate of 10% for the year 2008.

Cape Town CBD gross rentals receivable increased by R14/m², while Durban CBD saw an R8/m² within the same period. Johannesburg CBD experienced a great decline in gross rentals receivable by R26/m². Cape Town decentralised offices also experienced a smaller decline in gross rentals receivable by R3/m² from the previous year. Durban decentralised and Johannesburg decentralised were both experienced a growth of R8/m² and R4/m² respectively from the previous year. Cape Town CBD's performance seems to be attributed to lack of space in a prestigious location. Hence tenants were fine with paying a premium for space. The national all-office gross rentals receivable increased by R9/m² from 2008's R77/m² to 2009's R86/m². Cape Town CBD at R86/m² and Durban decentralised at R98/m² were the only two of the chosen CBD and decentralised areas to match or outperform the 2009 national all-office base rentals receivable of R86/m².

The growth in office capital values continued into 2009. Cape Town CBD offices saw a 12.4% point gain in capital values from the previous year, while Durban CBD offices experienced a 41.3% point increase within the same time frame. Johannesburg CBD offices saw a 12.7% point decline in capital values from the previous year. Cape Town decentralised office capital values upswing continued to slow down, capital values only increased by 6.3% points from the previous year. Durban decentralised offices saw a 19.1% point gain in capital values, while Johannesburg decentralised experienced a 27.8% point increase within the same period. National all-office capital values increased by 21.5% points from the previous year, and only Durban CBD, Johannesburg decentralised outperformed the national all-office growth in capital values from the previous year.

The number of office investments across the country declined by 43 from the previous year of 2008. This came as no surprise as the economy was in a downward spiral. Cape Town CBD experienced a decline of 1 from the previous year, while Johannesburg CBD saw a decline of 3 within the same

time frame. Durban CBD was the only one of the three chosen CBD's to experience a growth in office investments (11) from the previous year. All three chosen decentralised areas experienced a growth in the number of office investments from the previous year. Cape Town, Durban and Johannesburg decentralised areas saw a growth of 1, 2 and 43 office investments from the previous year. Johannesburg's growth was helped by the prestigious location of Sandton and Rosebank, which were both experiencing growth leading up to the FIFA 2010 World Cup.

The majority of base rental yields in South Africa was on the decline from the previous year of 2008. Cape Town CBD base rental yields saw a decline of 0.2% points from the previous year, while Johannesburg CBD experienced a 3.1% decline during the same period. Durban CBD saw an opposite performance with an increase in base rental yields by 2% points from the previous year. Cape Town decentralised base rental yield remained flat at 9.4% points from the previous year, while Durban decentralised saw a decline of 0.4% points within the same time frame. Johannesburg decentralised base rental yield experienced a growth in base rental yield of 0.5% points from the previous year. The national all-office base rental yield rate declined 0.2% points from the previous year's 10.4% to 2009's 10.2%. Durban CBD at 13.3%, Johannesburg CBD at 10.9%, Cape Town decentralised at 9.4% and Durban decentralised at 10.9% outperformed the national all-office base rental yield of 10.2% for the year 2009.

Similar to base rental yields, the majority of base rental growth were on the decline. Cape Town CBD base rental growth declined 1.2% points from the previous year. Durban CBD saw a 1.4% point increase from the previous year. Johannesburg CBD experienced a tremendous decline of 77.1% points from the previous year of 2008. The downward trend continued as Cape Town decentralised saw a decline of 14.5% points from the previous year. Durban and Johannesburg decentralised both experienced a 0.7% point and 0.3% point respectively from the previous year. The national all-office base rental growth rate declined by 8.3% points from the previous year's 15.6% to 2009's 7.3%. Durban CBD at 13.3%, Cape Town decentralised at 7.4% and Johannesburg

decentralised all matched or outperformed the national all-office base rental growth rate of 2009.

Cape Town CBD income return for the second consecutive year experienced an increase. Income return grew from 7% to 9.4% in the Cape Town CBD office market. Cape Town CBD continued to prove to be an attractive location for tenants. The City Improvement District program continued to help ensure a pleasant and clean CBD environment. Durban CBD also saw an increase of 2.7% points from the previous year, while Johannesburg experienced a decrease of 0.2% points. Cape Town decentralised had a decline of 0.4% points in office income return from the previous year, while Durban decentralised saw a 0.3% point incline within the same timeframe. Johannesburg decentralised also saw a decline in income return by 0.4% points from the previous year. The national all-office income rate increased by 0.2% points to 9.4% in 2009, in which Cape Town CBD (9.4%) Durban CBD (11.6%), Johannesburg (10.1%) and Durban decentralised (9.6%) managed to match or outperform benchmark for the year.

Total return in the office market across the country was predominantly on the decline. As the national total return for offices continued to decline the market plunged further into a Market Contraction phase heading towards a Recession phase of the property cycle. Cape Town CBD offices experienced a 1.8% point decline in total return from the previous year, while Johannesburg CBD saw a 15.4% point decline during the same period. However, Durban CBD office total return remained flat at 11.9% from the previous year. Cape Town decentralised downward performance continued as total return declined for the third consecutive year. From the previous year, total return in Cape Town declined a further 10.2% points, while Durban decentralised experienced a 6.5% point decrease within the same time frame. Johannesburg decentralised saw a decline of 1.9% points from the previous year, while the national all-office total return rate declined by 5.4% points to 8.3% from the previous year. Durban CBD at 11.9% and Johannesburg CBD at 10.7% both outperformed the national all-office total return rate benchmark of 2009.

4.12. Property Performance Between 2001-2009

During the period of 2001 to 2008, the three cities experienced all four phases of the property cycle (Investment Property Databank 2013). In the year 2001 going into 2002, the office property market was in the Recession phase as year on year total returns were consistently declining. Office vacancies across the country increased, in particular as Cape Town CBD vacancies raised by 9.4% points, Johannesburg CBD vacancies increased by 14.6% points and Johannesburg decentralised vacancies had risen by 2.5% points going into 2002. The IPD reported total return across the three cities decreased across the board. Johannesburg CBD total return took a the biggest dive decreasing by 12.1% points leaving Durban Decentralised's total return for 2002 at 3.5%. Total return decreasing by 2.9% points in Cape Town CBD, Durban CBD by 1.1% points, Cape Town Decentralised by 0.2% points, Johannesburg CBD by 9.1% points and Johannesburg Decentralised by 2.5% points respectively, all performed in sync with the national total returns performance decreasing by 2.6% points.

The Investment Property Databank (2013) reported the years 2002 to 2007 saw the greatest prosperity and growth during the period of 2001 to 2009. The office market entered the Market Expansion phase. Cape Town CBD total return increased from 6.5% to 26% during this period. Durban Decentralised total return had a similar performance in 2002 with a total return was -9.1% that increased to 26.3% by 2007. Johannesburg Decentralised total return increased to 25.9% from 4.1% during the period of 2002 to 2007. This comes as no surprise as national total returns increased from 5.1% to 30.5% within the same time period. IPD also reported in the years 2002 to 2007, capital values steadily increased year on year except for Johannesburg CBD in 2004, and Cape Town and Durban CBD in 2006. This performance is supported by inflation coupled with the growth in gross rental receivables over the years 2002 to 2007. The buoyant office market performance during this period was observed through consistent on average decreasing vacancies throughout all the cities chosen for this study. In 2002 Cape Town CBD vacancy rates were 26,2%, and by 2007 vacancy rates had dwindled to 5.8%. The decrease in

vacancy rates in the three chosen cities was in sync with the national vacancy rate for office space as it declined from 24.4% to 6.4% during the years 2002 to 2007. Johannesburg CBD benefitted greatly from its inner-city redevelopment programs such as the Maboneng Precinct as office vacancies in the area declined from 45.4% to 7.8% in the years between 2002 and 2007. The rapid decline was based on office building being converted into accommodation coupled with a resurgence of small businesses, artists and professionals acquiring space in the area.

During 2007, the Investment Property Databank (2013) reported the office market began to experience the Market Contraction phase. During this phase vacancy rates increased drastically in some areas. An outlier in Cape Town CBD vacancy rates increased from 5.8% to 14% from 2007 to 2009. The other two cities decentralised performed in sync with the national all office vacancy rate (which increased from 6.4% to 10%) recording relatively similar increases in vacancies. Although the office market was in the Market Contraction phase, as with the Market Expansion phase, IPD recorded gross rental receivables continued to increase off the back of inflation. The increase in gross rental receivables was also bolstered by a decline in new office space as the number of investments declined since 2004. Income Return remained stagnant over the years mostly with little to no growth indicating potential that investors would wait until the market returns.

4.13. Analysis of the Correlation Matrix and Efficient Frontiers

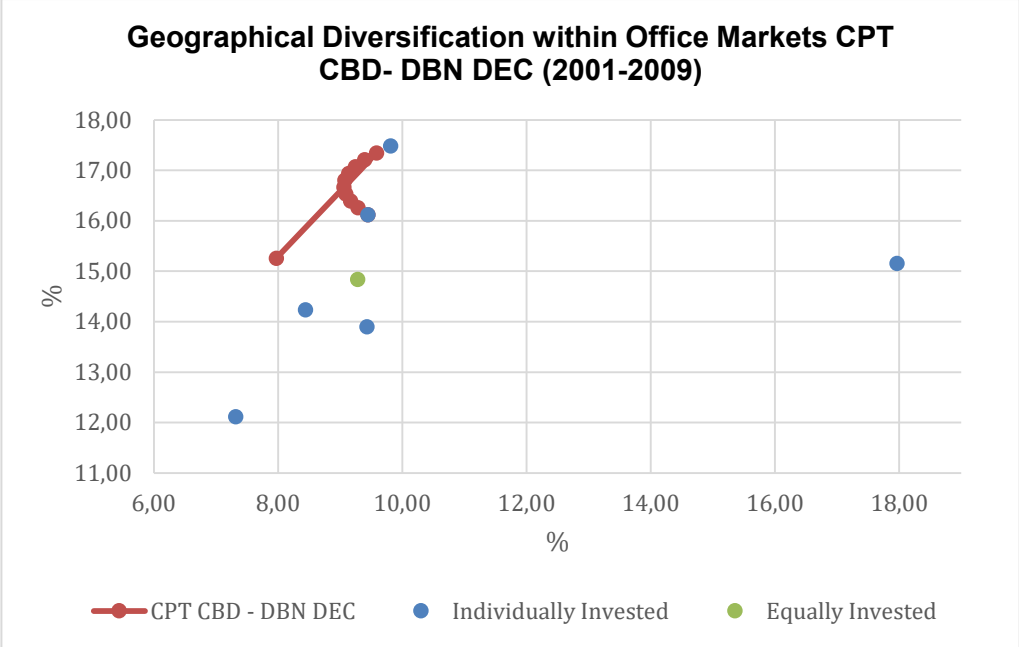
Correlation matrices provide insight into portfolios that can provide a greater or lower scope for diversification. However, correlation matrices can be rather limiting, as there is no consideration for asset risk-return relationship. For this reason, correlation matrices are often used in conjunction with efficient frontiers as a form of presenting methods of diversification while accounting for the risk-return relationship. The table below shows a correlation matrix of total returns in the CBD and decentralised markets of the three chosen cities.

	CBD: CPT	CBD: DBN	CBD: JHB	Decentralised CPT	Decentralised DBN	Decentralised JHB
CBD: CPT	1	0,71755	**0,461481**	0,937452	0,77689	0,898541
CBD: DBN	0,71755	1	0,74228	0,738013	0,668549	0,887082
CBD: JHB	**0,461481**	0,690967	1	0,666004	0,690967	0,675004
Decentralised CPT	0,937452	0,738013	0,666004	1	0,849842	0,89646
Decentralised DBN	0,77689	0,668549	0,690967	0,849842	1	0,769731
Decentralised JHB	0,898541	0,887082	0,675004	0,89646	0,769731	1

Source: Investment Property Databank (2013)

Table 31: Correlation Matrix

The purpose of the above correlation matrix is to display the relationship between two variables. According to the correlation matrix above CBD Johannesburg and CBD Cape Town provided greatest benefits for diversification by location during the years 2001-2009. The correlation matrix above shows that of the six different markets selected for this study, Johannesburg CBD and Cape Town CBD have the lowest correlation. The relationship between Johannesburg CBD and Cape Town CBD provided the lowest correlation at 0.461481, showing the highest chance of diversification amongst the different portfolio combinations. Thus, a combination of Johannesburg CBD and Cape Town CBD would provide the greatest opportunity of diversification within the selected six markets. However, as stated earlier, correlation matrices provide an insight into the level of diversification possible between various combinations, but does not take into consideration the risk and return relationship between the selected combinations. Thus it's necessary to take another step further in the analysis process by assessing the diversification possibilities while taking into considering the risk and return relationship between combinations.



Source: Investment Property Databank (2013)

Chart 2: Geographical Diversification within Office Markets CPT CBD – DBN Decentralised (2001-2009)

The results for the various efficient frontiers are presented in Appendix 7.14 for comparison. These graphs show an investors options taking into consideration the risk-return relationship when assessing different combinations of asset investments.

These efficient frontiers show that the benefits of diversification are exploited when an investors includes Durban CBD in their investment portfolio. Durban decentralised also had a major impact on the diversification potential for an investor, as the returns during that period were out of the ordinary. The combinations of Cape Town CBD-Durban CBD, Durban CBD-Johannesburg decentralised and Durban CBD-Johannesburg CBD seem to provide the most opportunities for diversification. The efficient frontier of portfolio combinations Cape Town CBD and Durban decentralised, are presented above in Chart 2. This chart displays the relationship between risk and return and presents an investor with various investment options to choose from. Each of these investment opportunities may be attractive to an investor, depending on their appetite for risk and investment mandate. A portfolio consisting of equally

investing across the chosen market segments would have yielded a return of 14,84% providing an average return, with a return similar to several of the portfolio combinations selected. However, higher returns were achievable for similar or even lower risk exposure. Investing solely in Durban CBD, provided the greatest risk, as the standard deviation of the portfolio was 17,96% which was 8,15% points higher than the second highest standard deviation (Durban Decentralised). In spite of the fact that Durban CBD carried a significantly greater risk, this investment would have only yielded an average of 15,15%. The investment combination of 10% Cape Town CBD and 90% Durban Decentralised provided the greatest investment opportunity to an investor who was seeking to maximise return, while minimising risk. The investment combination is positioned at the top of the efficient frontier providing a standard deviation of 9,58% and an average return of 17,35%.

The results of the efficient frontiers do not support the conclusions presented by the correlation matrix. As the correlation matrix suggests that a combination of Johannesburg CBD and Cape Town CBD provide the greatest benefits for diversification. As mentioned earlier, a correlation matrix analysis is rather limited as it only compares the correlation between the different market segments. It is clear that another method of diversification analysis must be explored to achieve a greater understanding of diversification by location possibilities.

Durban decentralised had an unprecedented high total return during the period of 2001-2009, providing the greatest total return of the three cities, with the lowest risk over the said period. The correlation matrix below shows that while high total returns were achieved in the Durban decentralised market, a combination of 10% Cape Town CBD and 90% Durban decentralised would provide similar returns while reducing an investor's risk. The combination of 10% Cape Town CBD and 90% Durban decentralised (standard deviation: 9,5817) provides a less volatile investment than directly investing solely in the Durban decentralised market (standard deviation: 9,8103) over the period of

2001-2009. The benefits of diversification by location are outlined below[6]:

	Offices: Decentralised: DBN	Equally Invested	10% CPT CBD 90% DBN DEC
Standard Deviation	9,810373181	9,27860403	**9,581711188**
Mean	17,48175	14,83803969	**17,34571078**
Coefficient of Variation	0,561177982	0,625325462	**0,552396573**

Table 32: Risk Return Relationships of Portfolio Combinations

The Coefficient of Variation is of great importance to property investors, particularly risk-averse investors. The CV expresses to an investor the risk to return ratio in their portfolio. The lower the CV, the lower the risk. This may be particularly important to certain investors who have limitations on the amount of risk that their portfolio is able to carry.

In summary of the presentation of the risk return relationships of portfolio combinations supports the literature reviewed by Miles and McCue (1982). In their study they found that diversification by geographic region has a positive effect on the risk-reward ratio in a portfolio. The combinations selected in this study showed the benefits of diversification by location are less volatility in investments, lower Coefficient of Variations while generating similar returns.

[6] A complete set of portfolio compbinations is included in the Appendix 7.14

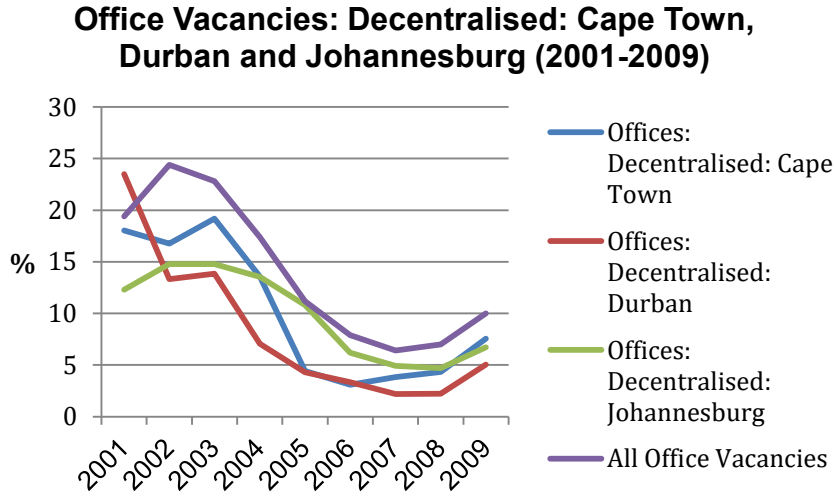
4.14. Research Questions

In Chapter 1, the following research questions were presented to test the hypothesis:

Research Question 1:

Is there a relationship between the property investment cycles of Cape Town, Durban, Johannesburg and the national property cycle?

Throughout the years of 2001 to 2009, there are recognisable expansion and contraction synchronicities.

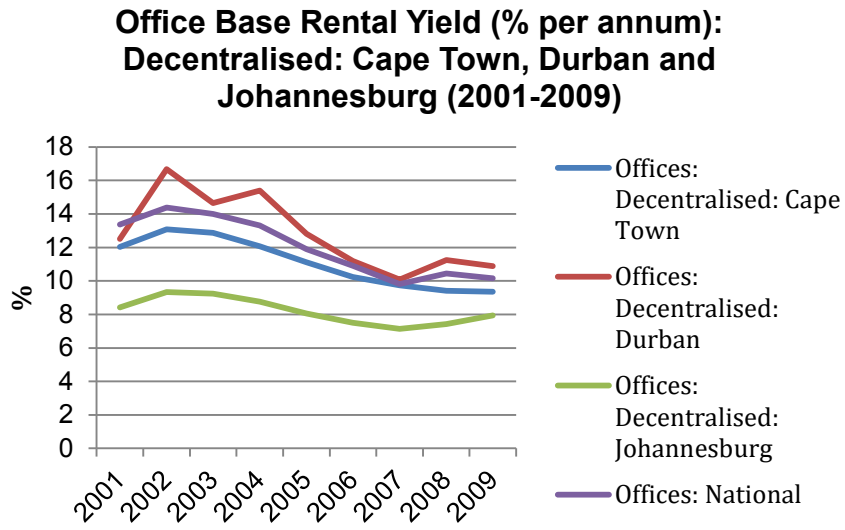


Source: Investment Property Databank (2013)

Chart 3: Office Vacancies: Decentralised: Cape Town, Durban and Johannesburg (2001-2009)

Chart 3 above displays the office capital vacancies of the three chosen cities and decentralised areas visually shows a similar pattern in expansions and contractions. The decentralised areas of each of the three cities experienced similar turning points to the national all office vacancy benchmark. In the year 2004, all three decentralised areas experienced consistent declines in vacancy rates until the year 2006. In the year 2007, Cape Town was the only decentralised vacancies market of the three selected cities to increase. The

growth in vacancies was measured at 0.7% points. This increase came at a time with the declines in vacancies across the board were starting to occur in smaller increments. For example the all office vacancy rate from 2006 to 2007 had declined by 1.5% points. However the decline from the year 2005 to 2006 the all office vacancy rate declined at 3.30% points. Each of the three cities decentralised areas established a pattern similar to the national all office vacancy rate by performing similarly over the years 2004, 2005 and 2006 experiencing declines in vacancies rates from the years before. Each year consecutively the vacancy rate declined.



Source: Investment Property Databank (2013)

Chart 4: Office Base Rental Yield (% per annum): Decentralised: Cape Town, Durban and Johannesburg (2001-2009)

Chart 4 above displays the base rental yield of offices in the decentralised areas of all three chosen cities. The chart indicated a similar synchronised pattern of growth and decline, providing further evidence of diversification by location benefits. The years 2001 and 2002 brought year-on-year growth in office base rental yields across all three selected cities. The growth in base rental yields was supported by similar growth in the national all office base rental yield during the same period. All three cities CBD and decentralised markets experienced a similar turning point as the national all office base rental yield during the year 2003. The year 2003 marked the beginning of consistent year-on-year decline

of all office national base rental yield until the year 2007. This turning point was shared amongst the majority of the three selected cities CBD and decentralised areas. Cape Town CBD proved to be an outlier with sporadic increases in base rental yield in the years 2004 and 2007. Durban CBD was the second outlier in this series of events as 2004 presented a rise in base rental yield growth. The following year, Durban CBD reverted back to the pattern shared by all three cities CBD and decentralised areas as well as the national office base rental yield benchmark.

The year 2001 saw high cap rates throughout all three CBD and decentralised office markets. In the same year, vacancies across the board were high as the office market was in contraction phase. In 2002, Capitalisation rates across all three cities CBD and decentralised areas simultaneously increased from the previous year. Office vacancies in the year 2002 across the board all increased, except for Durban CBD, Durban decentralised and Cape Town decentralised which all experienced a decrease in office vacancies. Gross rentals receivables in the year 2002, underwent positive growth from the previous year as the national all-office gross rentals receivable rate increased in tandem with Cape Town and Durban CBD and decentralised areas. Johannesburg decentralised also experienced a growth in gross rentals receivable, however Johannesburg CBD saw a decline from the previous year. During the year 2002, both Durban and Johannesburg CBD and decentralised area office markets declined in tandem with national all-office capital values from the previous year. Cape Town decentralised also experienced a decline in office capital values from the previous year, however Cape Town CBD saw an incline within the same time frame.

In 2003, total return in the CBD and decentralised office markets increased throughout Cape Town, Durban and Johannesburg from the previous year. This upward performance was mirrored in the national all-office total return rate, as it also increased from the previous year. An opposite performance was experienced during the period 2003 to 2006 as office cap rates in all three cities CBD nodes declined. However the year 2003, saw a growth in decentralised office capital values of the three chosen cities as well as national all-office

capital values that would continue for the next four years to 2007.

The year 2004, saw the national all-office base rental growth increase, in tandem with all three cities CBD office nodes. In 2005, all three CBD and decentralised nodes experienced a decline in office cap rates from the previous year of 2004. An opposite reaction was experienced in total return in 2005, as total return figures increased in all three CBD and decentralised areas from the previous year. The period of 2005-2006 saw the decline of base rental yields across the three cities CBD and decentralised markets and also the national all-office base rental yield rate. The year 2006 saw the first of two consecutive years where all three chosen CBD nodes experienced a decline in the number of investments from the previous year. In the year 2006, all three CBD and decentralised areas experienced a decline in base rental yields from the previous year. This downward trend of CBD's and decentralised areas, also affected the national all-office base rental yield, which saw a decline from the previous year.

In 2007, growth in gross rental receivables was witnessed across all three CBD and decentralised nodes, as well as the national all-office gross rental receivable benchmark from the previous year. The growth in 2007 from the previous year extended to office capital values as all three cities CBD and decentralised areas experienced growth in tandem with the national capital values for office benchmark. In 2009, decentralised office capital values all three chosen cities increased from the previous year, as did national all-office capital values. In the same year, the total return of all three cities decentralised office markets also declined in tandem with the national all-office total return rate from the previous year. A decline was also experienced in the three decentralised areas base rental yields from the previous year, which was similar to the performance of the national all-office base rental yield. However, in 2009, the income return of the three chosen CBD markets experienced similar small increases from the previous year as did the national all-office income return.

It has been clearly shown that there is a relationship between the different

property investments, property cycles of Cape Town, Durban and Johannesburg, as throughout the timeline of 2001 to 2009, there have been multiple similar reactions of the three cities. The similarities in performance across the years show there is a relationship between the cities.

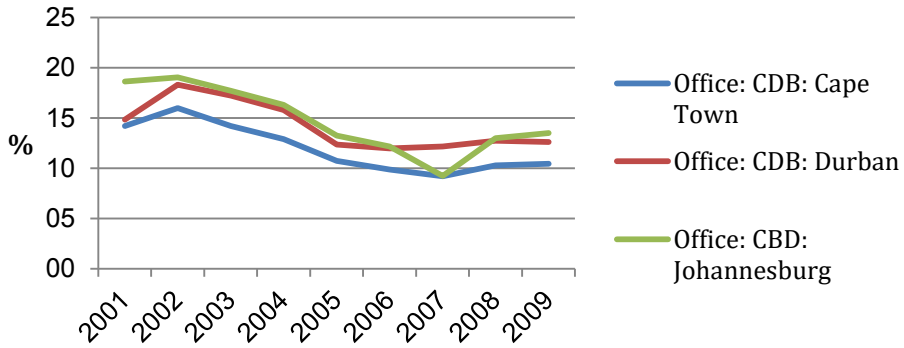
Research Question 2:

Is there a recognisable pattern between the property investment cycles of these cities?

Based on the analysis, there were several patterns that were discovered. As shown in the analysis each individual CBD and decentralised area often acted in synchronisation with the national cycle. To answer Research Question 2, five examples from the data were presented below to prove recognisable patterns exist between the property investment cycles of the three chosen cities.

Chart 3 on page 111 shows how decentralised office vacancies in Cape Town, Durban and Johannesburg followed the national all-office vacancy performance throughout the timeline. Halfway through 2003, all three cities experienced a downward trend in vacancies as expansion occurred, which continued until mid-2008.

Office Capitalisation Rates: CBD: Cape Town, Durban and Johannesburg (2001-2009)

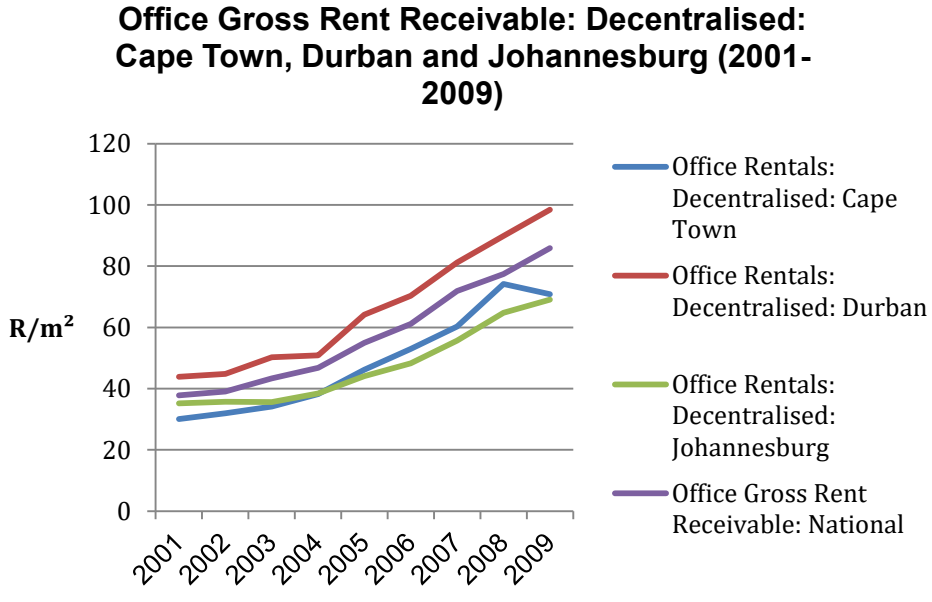


Source: Rode & Associates (2013)

Chart 5: Office Capitalisation Rates: CBD: Cape Town, Durban and Johannesburg (2001-2009)

The above chart clearly shows how office cap rates of Cape Town, Durban and Johannesburg CBD areas experienced a similar performance until the year 2007. During the years 2001 and 2002, all three CBD office cap rates increased in tandem. In the year 2003, a turning point is observable as cap rates across all three of the selected CBD markets began to decline. The selected CBD markets of Cape Town and Johannesburg had a similar performance during the years of 2003 to 2007. For instance in the year 2003 to 2004 office cap rates in Johannesburg CBD declined 1.4% points, while Cape Town CBD office cap rates declined 1.3% points. Similar performances were found again during the year 2007, when Cape Town CBD and Johannesburg CBD office cap rates both declined to 9.2% and 9.3% respectively. The year 2008 marked another turning point for the three selected CBD office cap rates, as all three markets increased in tandem from the previous year.

Gross rental receivables in the three decentralised markets is another example of a pattern that presented itself through the analysis.



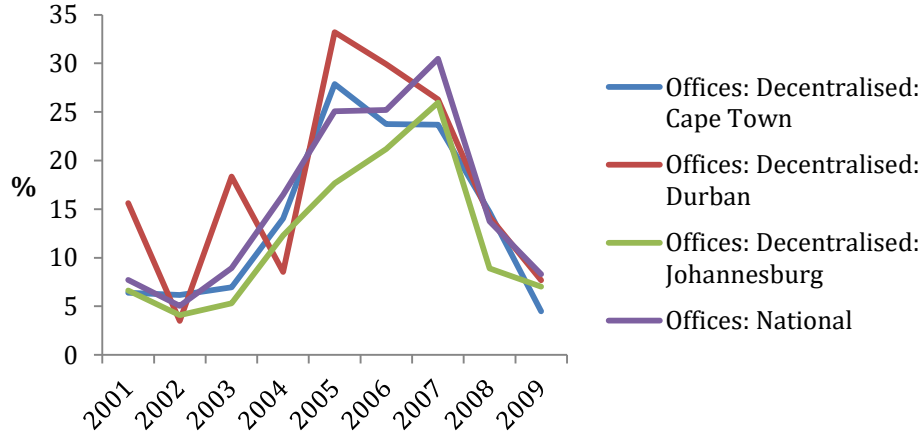
Source: Investment Property Databank (2013)

Chart 6: Office Gross Rent Receivable: Decentralised: Cape Town, Durban and Johannesburg (2001-2009)

The above decentralised Gross Rent Receivable chart shows a very similar upward trend across all three decentralised areas that were in sync with the national gross rental receivable growth rate during 2001 to 2009. During this period decentralised gross rental receivables in Cape Town, Durban and Johannesburg grew by R41, R54 and R34 respectively. The growth in gross rental receivables by all three selected decentralised markets was similar to the growth experienced by the national all office gross rental receivable benchmark of R48 over the same period.

Chart 4 depicting decentralised office base rental yield performance shown on page 124 shows another example of a similar pattern that was experienced across all three cities. The national office base rental yield experienced a downward trend from mid-2003 to mid-2007, which all three cities had a similar trend performance over the same period.

Office Total Return (% per annum): Decentralised: Cape Town, Durban and Johanesburg (2001-2009)

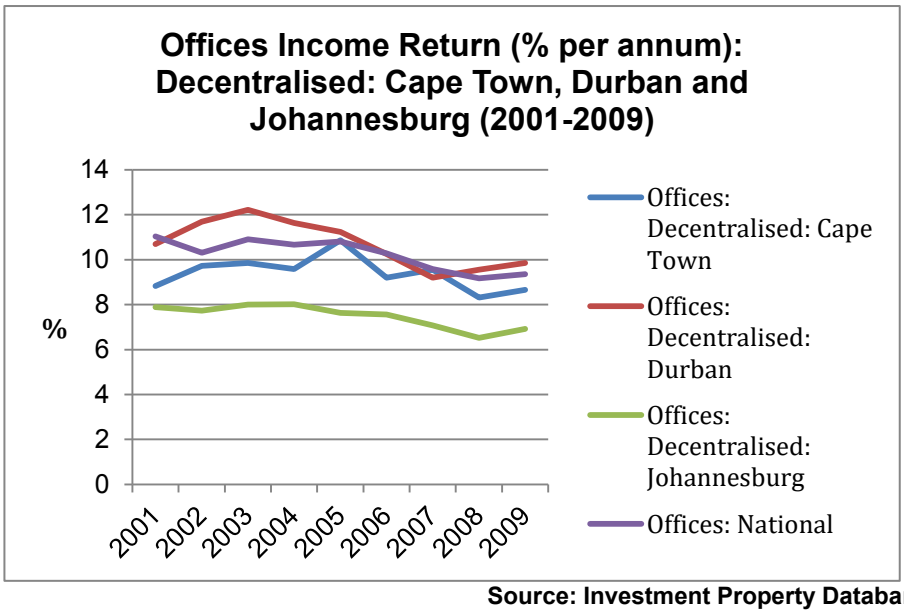


Source: Investment Property Databank (2013)

Chart 7: Office Total Return (% per annum): Decentralised: Cape Town Durban, and Johannesburg (2001-2009)

Chart 7 above shows how the total returns percentage per annum in decentralised Johannesburg and Cape Town were both in sync with the decentralised national office benchmark. Durban decentralised office space was the outlier. It followed the pattern of the other two cities and national benchmark, however, deviated from the norm with a more aggressive rate than

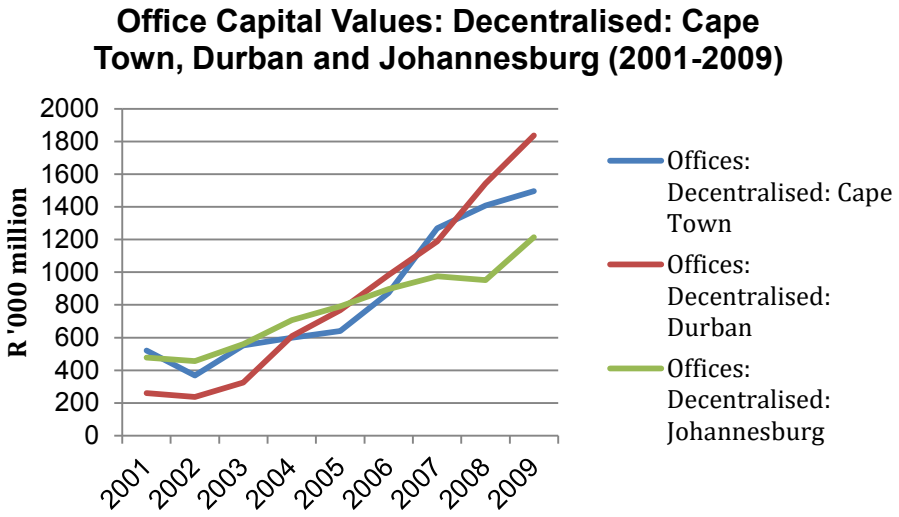
any of the other two chosen cities. The years 2001 and 2002, South Africa's property cycle was still experiencing the Recession phase. Hence up until 2002, total returns across the board were declining. In 2003, total returns in all three selected cities CBD and decentralised markets experienced the same turning point as the national all office total return benchmark. During the years 2003 to 2005, the national all office total return rate increased dramatically. As the market was experiencing the Recovery phase of the cycle, total returns increased by 7.6% points. The Market Expansion phase saw national office total returns increasing by 5.4% to 30.5%. This was the highest total return experienced during the selected period of 2001 to 2009. Subsequent to the rapid growth in the national all office total returns, the Market Contraction phase in the cycle brought total returns crashing down rapidly. Total returns in 2008 dropped over 50% from the previous year to 13.8%. The following year, 2009, saw further declines as all office total returns declined to 8.3%. Throughout the years of 2001 to 2009, Durban decentralised was the outlier performing with greater volatility than the other two selected decentralised markets. Cape Town and Johannesburg decentralised closely followed the turning points of the all office total returns performance throughout the selected years.



Source: Investment Property Databank (2013)

Chart 8: Office Income Return (% per annum): Decentralised: Cape Town, Durban and Johannesburg (2001-2009)

Chart 8 is another example of visible synchronicities between the three chosen cities and the national benchmark. It represents the income return percentage per annum of Cape Town, Durban and Johannesburg decentralised office markets over the years 2001 to 2009. The all office national income return rate remained relatively flat experiencing small inclines and declines over the years 2001 to 2009. The three selected decentralised office markets followed similar patterns often experiencing small incremental inclines and declines in income returns over the years.



Source: Investment Property Databank (2013)

Chart 9: Office Capital Values: Decentralised: Cape Town, Durban and Johannesburg (2001-2009)

Chart 9 shows a visible synchronised upward trend of all three chosen cities' decentralised office capital value markets during the period of 2001 to 2009. All three cities' decentralised office capital values experienced a slight decline from 2001 to 2002. However from 2003 to 2009, the similar synchronised upward trend was experienced. Nationally, capital values have steadily inclined throughout the selected timeframe, aside from the year 2002. Decentralised office markets of all three selected cities experienced a similar growth pattern. The year 2002 was the only year in which there was a decline in decentralised capital values across the three cities. Subsequent to that, the only outlier from

all three selected cities decentralised markets was Johannesburg decentralised in 2008, as the segment experienced a decline in capital values.

There are several recognisable patterns that have been shown above, which indicate synchronicities between the three different cities' CBD and decentralised office markets over the period of 2001 to 2009.

Research Question 3:

Is there any benefit to diversification by location within the South African property market?

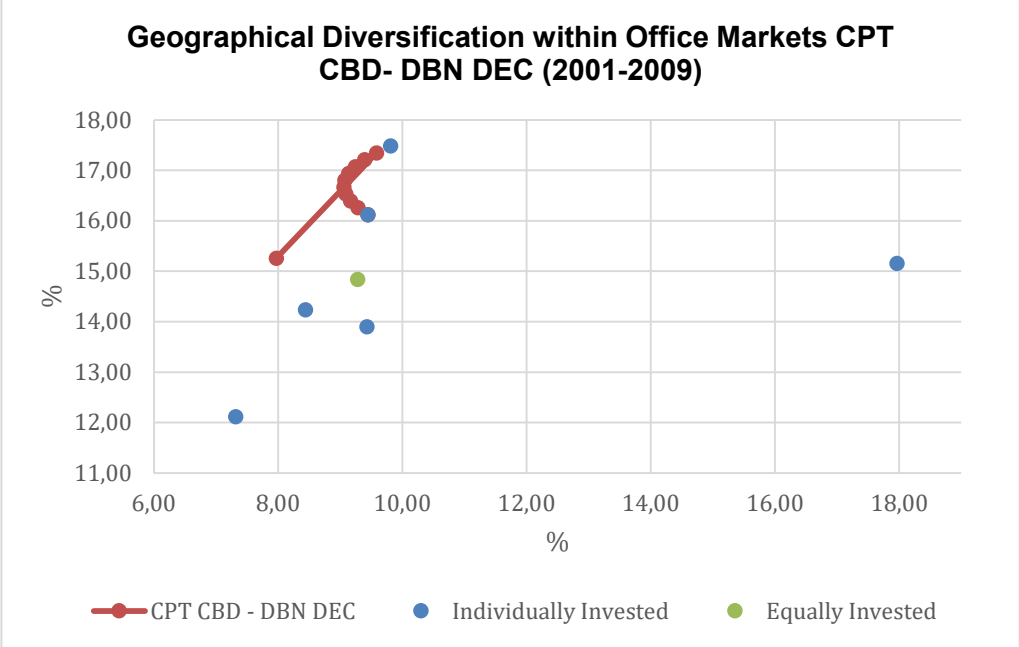
The correlation matrix presented below was created to provide insight into whether a combination of the chosen market segments could provide a greater or lower scope for diversification.

	CBD: CPT	CBD: DBN	CBD: JHB	Decentralised CPT	Decentralised DBN	Decentralised JHB
CBD: CPT	1	0,71755	**0,461481**	0,937452	0,77689	0,898541
CBD: DBN	0,71755	1	0,74228	0,738013	0,668549	0,887082
CBD: JHB	**0,461481**	0,690967	1	0,666004	0,690967	0,675004
Decentralised CPT	0,937452	0,738013	0,666004	1	0,849842	0,89646
Decentralised DBN	0,77689	0,668549	0,690967	0,849842	1	0,769731
Decentralised JHB	0,898541	0,887082	0,675004	0,89646	0,769731	1

Source: Investment Property Databank (2013)

Table 31: Correlation Matrix

A portfolio combination of Cape Town CBD and Johannesburg CBD provided the greatest opportunity for diversification. However as stated before, a correlation matrix has no consideration for asset risk-return ratios. Thus an additional analysis method comprising of building portfolio combinations using a weighted system to present efficient frontiers was necessary.



Source: Investment Property Databank (2013)

Chart 2: Geographical Diversification within Office Markets CPT CBD – DBN Decentralised (2001-2009)

Above is an efficient frontier which shows the geographical diversification within office markets, using three different portfolio combinations. The benefits of diversification became apparent when adding Durban CBD or Durban Decentralised into an investor's portfolio. Durban Decentralised particularly proved to be a must have in an investor's portfolio, if the intention was to increase returns while minimising risk. Individually investing solely in each of the market segments provided investment opportunities that were either significantly higher in risk, or had significantly lower returns than that of a portfolio combination of assets diversified by location. Equally investing across all of the chosen market segments provided relatively lower risk exposure. However the lower risk would be coupled with significantly lower returns. The portfolio combination of 10% Cape Town CBD and 90% Durban Decentralised office space over the periods 2001 to 2009, provided very high returns and slightly lower risk than investing solely in the Durban Decentralised office market.

4.15. Conclusion

The quantitative analysis completed took into account various property investment variables such as but not limited to gross rent receivables, vacancies, income return and total return. These variables were used as the basis for determining whether there are synchronicities in the property investment cycles of three different South African cities over the period of 2001 to 2009.

The analysis revealed that there certainly were similar patterns experienced across all three cities during the selected years of the study. This section went into great detail, outlining the conclusions of this analysis as well as answering the research questions that tested the hypothesis.

5. Conclusion

5.1. Introduction

In Chapter 2, the literature review, presents different schools of thought on property cycles. However, while there is a school of thought that does not value the importance of property cycles, for the purpose of this study, the opposite schools of thought were researched further. The literature review presents a clear need for the understanding of property cycles, and also shows that there is a vast amount of research that has been conducted over the years in the United States, the United Kingdom and various European countries with a specific focus on office space, validating the need for further property cycle research in South Africa. The understanding of property cycles and diversification have a great impact on the minimising of risk in an investor's portfolio. Due to the need of minimising risk and increasing return, a greater emphasis has been placed on research detailing diversification methods. The comparative analysis used set out to prove that there was a relationship between the property cycles of Cape Town, Durban and Johannesburg, using twelve different variables as economic indicators to measure the performance over nine years.

In Chapter 4 the analysis concluded that there are synchronicities in the performance of three different major cities in South Africa's property industry, which will be presented in this chapter. This chapter provides answers to the research questions that were set out in the introductory chapter of this research. The quantitative analysis in conjunction with the research literature provided key insights into the property office investment cycle of 2001 to 2009. This chapter will provide an overview of the research conducted and explains the conclusions and provide an insight on how this research will be useful and what future opportunities are available to expand on this research.

5.2. Overview of Analysis

The quantitative analysis that was conducted in this study provided empirical evidence of the office property cycle performance in South Africa during a set period of 2001 to 2009. Furthermore, the study showed the relationships in property industry performance within three major cities.

The study commenced with a general investigation into property cycle literature. The economic structure of the chosen cities of Cape Town, Johannesburg and Durban were then presented with the intention of seeking relationships and similarities between each of the three cities. The body of works establishing the validity of property cycle research was represented together with other schools of thought that negate the importance of property cycles. Adding on to the definition of a "cycle", different methods of identifying a property were also presented. The two methods expressed the importance of categorising elements and the performance of a property cycle into groups to be analysed. The analysis in this study conducted was used to establish expansion, contraction, peak and trough patterns throughout the three CBD and decentralised areas. Within the four periods, property investment variables such as rents receivable, total return, vacancies and capitalisation rates were analysed for growth and decline by city.

While the understanding of property cycles is of paramount importance to an investor, the understanding of lowering risk is also of great importance to all stakeholders. Various elements of risk and risk mitigation are explored through portfolio theory. Risk is ever present with dealing in property, and can never be fully eliminated, however investors will consistently seek ways to mitigate risk. The common consensus within the portfolio theory research is to lower risk in one's portfolio, diversification is a necessary tool. Methods of analysing the risk return ratio are explored through the Capital Asset Pricing Model, which helps show a clear relationship between risk and return. Research covering business cycles and spatial theory provided an in-depth review of the relationships that microeconomic and macroeconomic factors have on property cycles.

Diversification is the last area of discussion from a theoretical perspective in this study. Diversification can take place across different locations, property types and quality types. To establish whether diversification by location is a viable investment tool, one would first need to establish whether there is a pattern and whether the various investment locations follow that pattern in sync. Once the expansion, contraction, peak and troughs throughout the three CBD and decentralised areas were defined, the study investigated patterns for comparison. The resultant patterns were used as a basis for the justification of diversification by location, subsequent to establishing a relationship between the three chosen cities.

The correlation matrix presented in Chapter 4, showed that a portfolio combination of Cape Town CBD and Johannesburg CBD has the greatest benefits of diversification by location without taking the risk-return relationship into consideration. Furthermore, the risk-return relationships of various portfolio combinations were investigated to assess whether an investor would have achieved similar or higher returns investing solely in one market segment, or equally investing across three different cities CBD and decentralised market segments or lastly a portfolio combination between different cities. The risk-return relationships of equally investing across three different cities CBD and decentralised market segments provided significantly lower returns and lower risk than investing solely in Durban Decentralised. The Coefficient of Variation from the equally invested portfolio (0,625325462) was also significantly higher than that of Durban Decentralised (0,561177982). Thus the best investment approach is that of creating portfolio combinations between the different cities' CBD and decentralised market segments. The findings were that a portfolio combination of 10% Cape Town CBD and 90% Durban Decentralised provided the greatest benefits of diversification by location. This portfolio combination provided the greatest benefits of diversification by location. This portfolio combination provided similar returns (9.581711188) as investing entirely in the market with the highest returns (Durban Decentralised: 9,810397181) over the chosen period. However the diversified portfolio combination provided lower risk than investing solely in Durban Decentralised. The portfolio combination

of 10% Cape Town CBD and 90% Durban Decentralised provided a lower Coefficient of Variation (0,5523965673) than investing solely in Durban Decentralised (0,561177982), showing risk is lowered by investing in the said portfolio combination.

The research conducted in this study was aimed at looking at whether unique location and economic characteristics of three different cities in one country were sufficient enough to differentiate the property cycles between cities. The study also aimed to provide an in-depth analysis of property cycle activity in a South African property cycle and how different cities' property investment cycles in South Africa reacted to the national property investment cycle. This information enables investors to make investment decisions. Various theories have been presented in the literature review advocating analysis from a microeconomic viewpoint and property investment diversification by location. Studies published in 1980's have concluded that diversification by geographic location provided superior benefits to investors.

5.3. Conclusion

This research work looked to the past, to find answers, which can be applied to the future of South African property investment cycles. The results show several recognisable patterns that indicate a relationship amongst the three cities and national trends. In particular, there is an overall concomitant pattern of behaviour in respect of the three cities relative to national trends. The expansions and contractions of the three cities mirrored those of the latter.

The most recent full property cycle of 2001 to 2009 was selected to do a quantitative analysis. A hypothesis was put forth: *The property cycle in South Africa is related, but also varies amongst major cities.*

Subsequent to literary research in Chapter 2 and a quantitative comparative analysis in Chapter 4, the hypothesis were tested. The study found that there are multiple synchronicities in the property cycles of three different cities across the country. The performance of the three cities was not only compared to each other, but also against an all-city national benchmark performance. The study

not only demonstrated that there were synchronicities between the property cycles of the three cities, but also showed the benefits of diversification by location. These support the propositions of the study. In particular, the following hypothesis was put forward; *The property cycle in South Africa is related, but also varies amongst major cities*. The three methods of analysis support the hypothesis. The property cycle is related, but it certainly does vary amongst the major cities; thus providing an investor with opportunities to diversify by location.

The lessons that were learned during this research study can be used to facilitate the improvement of an investor's decision-making when looking at diversifying investments within their portfolio in the South African property sector.

Based on the research and analysis that was completed, the following recommendation is made:

Domestic and foreign property investors looking to reduce risk in their portfolio can do so by investing in the same property type/class while diversifying geographically across different major cities in South Africa.

5.4. Future Areas of Research

During the process of conducting this research study, a few future areas of research presented themselves. European and American researchers have published a vast amount of research studying property investment cycles, but that is not the case locally. There is a gap in the research, in that there is a lack of research that is conducted by South African authors detailing South African property cycles.

This study provides a platform for an econometric analysis to take place to gain further understanding of the relationships in the performance of various cities in South Africa.

This study looked at the use of commercial office space in three major cities of

Cape Town, Durban and Johannesburg. There is potential to gain more insight into the South African property cycle by conducting a similar study using various smaller cities such as Polokwane, Bloemfontein and East London. On a micro scale one could look at using the methods used in this study to investigate the property investment cycles of South African boom-towns off the back of mining activity.

While the Investment Property Databank created a very well compiled report on the performance of properties in South Africa, there is a shortage of market data sources available. A strong gap in the market which needs to be filled is comprehensive and systematic data collection by other sources.

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7. Appendix

7.1. Capitalisation Rates Data

CBD Office Cap Rates

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	14,2	16,0	14,2	12,9	10,7	9,9	9,2	10,3	10,5
Durban	14,8	18,3	17,3	15,8	12,4	12,0	12,2	12,8	12,6
Johannesburg	18,6	19,1	17,7	16,3	13,3	12,2	9,3	13,0	13,5

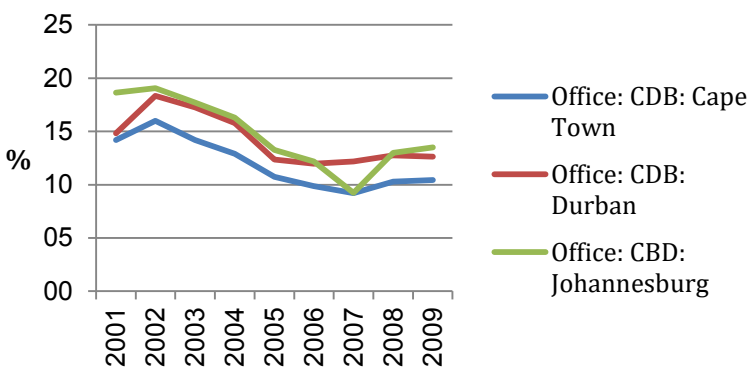
Source: Rode & Associates (2013)

Decentralised Office Cap Rates

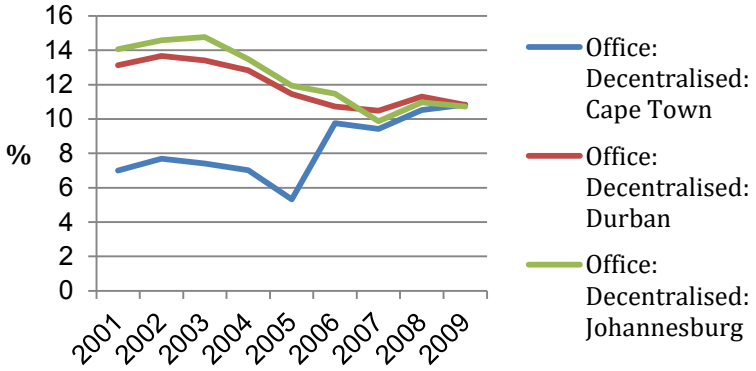
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	7,0	7,7	7,4	7,0	5,3	9,8	9,4	10,5	10,8
Durban	13,1	13,7	13,4	12,8	11,4	10,7	10,5	11,3	10,8
Johannesburg	14,1	14,6	14,8	13,5	11,9	11,5	9,9	10,9	10,7

Source: Rode & Associates (2013)

Office Capatalisation Rates: CBD: Cape Town, Durban and Johannesburg (2001-2009)



Office Capatalisation Rates: Decentralised: Cape Town, Durban and Johannesburg (2001-2009)



7.2. Vacancies Data

CBD Office Vacancies (%):

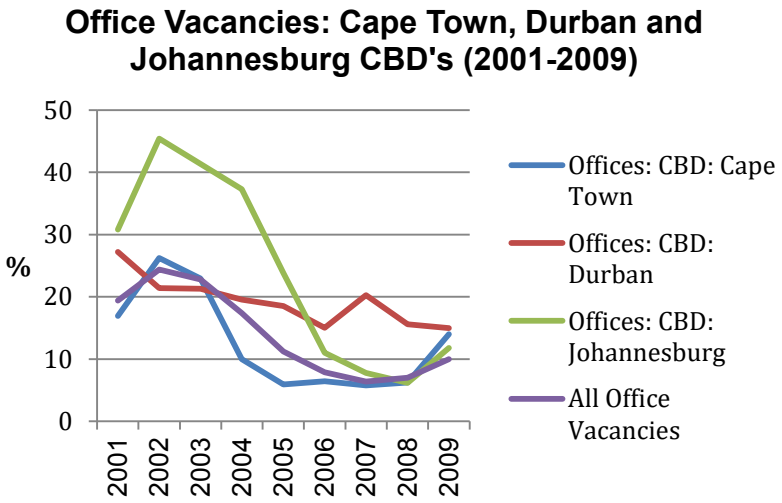
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	16,9	26,2	22,9	9,9	5,9	6,4	5,8	6,2	14,0
Durban	27,2	21,4	21,3	19,5	18,5	15,0	20,3	15,6	14,9
Johannesburg	30,8	45,4	41,3	37,3	23,8	11,0	7,8	6,2	11,8
National	19,4	24,4	22,8	17,4	11,2	7,9	6,4	7,0	10,0

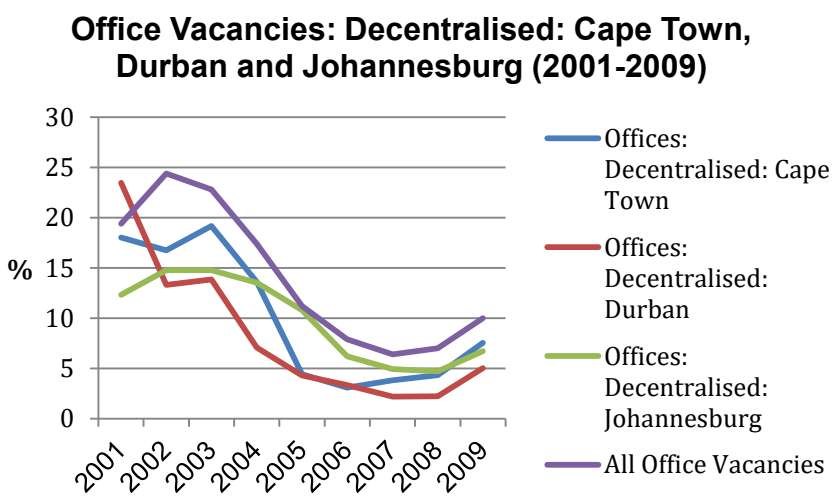
Source: Investment Property Databank (2013)

Decentralised Office Vacancies (%):

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	18,4	16,8	19,2	13,6	4,4	3,1	3,8	4,3	7,6
Durban	23,5	13,3	13,9	7,1	4,3	3,3	2,2	2,2	5,0
Johannesburg	12,3	14,8	14,8	13,5	10,8	6,2	4,9	4,7	6,7
National	19,4	24,4	22,8	17,4	11,2	7,9	6,4	7	10

Source: Investment Property Databank (2013)


Office Vacancies: Cape Town, Durban and Johannesburg CBD's (2001-2009)
%
50
40
30
20
10
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: CBD: Cape Town
Offices: CBD: Durban
Offices: CBD: Johannesburg
All Office Vacancies


Office Vacancies: Decentralised: Cape Town, Durban and Johannesburg (2001-2009)
%
30
25
20
15
10
5
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: Decentralised: Cape Town
Offices: Decentralised: Durban
Offices: Decentralised: Johannesburg
All Office Vacancies

7.3 Gross Rental Receivable Data

CBD Office Gross Rentals Receivable: (R/m²)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	42	44	48	54	72	68	74	72	86
Durban	28	40	39	41	42	44	47	55	63
Johannesburg	25	17	20	26	41	54	62	89	63
National	38	39	43	47	55	61	72	77	86

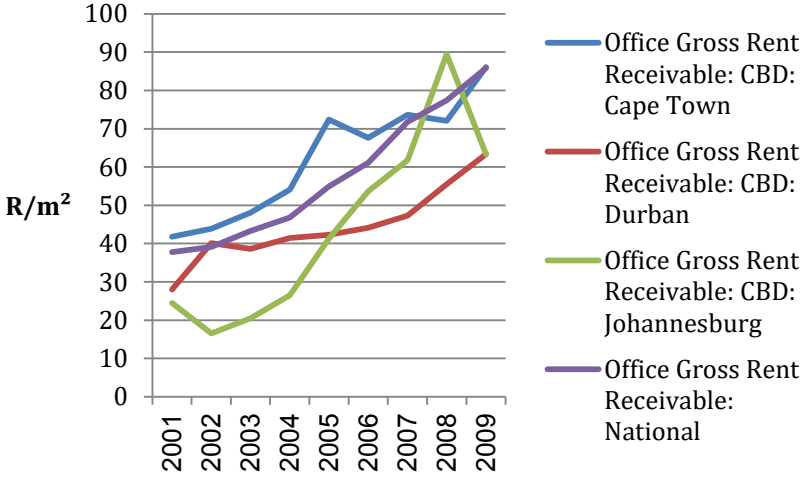
Source: Investment Property Databank (2013)

Decentralised Office Gross Rentals Receivable: (R/m²)

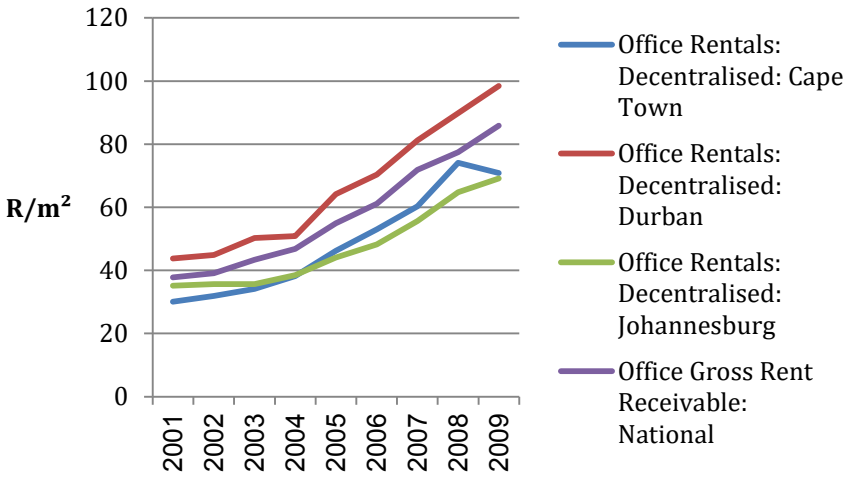
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	30	32	34	38	46	53	60	74	71
Durban	44	45	50	51	64	70	81	90	98
Johannesburg	35	36	36	38	44	48	56	65	69
National	19,4	24,4	22,8	17,4	11,2	7,9	6,4	7,0	10,0

Source: Investment Property Databank (2013)

Office Gross Rent Receivable: CBD: Cape Town, Durban and Johannesburg (2001-2009)



Office Gross Rent Receivable: Decentralised: Cape Town, Durban and Johannesburg (2001-2009)



7.4 Capital Value Data

CBD Office Capital Value (R million)

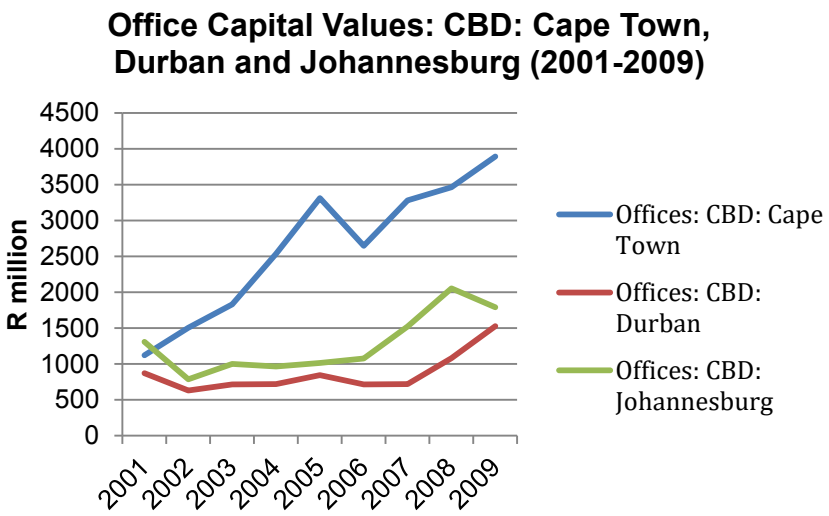
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	1120	1506	1832	2539	3315	2650	3282	3465	3896
Durban	873	632	718	720	846	716	721	1083	1530
Johannesburg	1310	787	1000	968	1013	1078	1524	2055	1794
National	15857	14302	18142	23091	26204	29527	34470	37233	45248

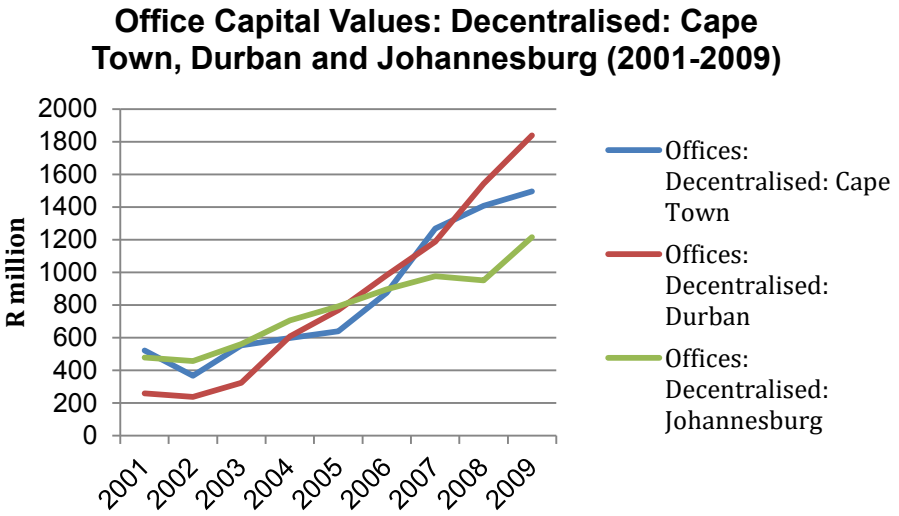
Source: Investment Property Databank (2013)

Decentralised Office Capital Value (R million)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	521	367	553	599	640	874	1269	1408	1497
Durban	259	238	324	608	768	983	1188	1543	1838
Johannesburg	478	456	561	707	791	897	976	951	1215
National	15857	14302	18142	23091	26204	29527	34470	37233	45248

Source: Investment Property Databank (2013)


Office Capital Values: CBD: Cape Town, Durban and Johannesburg (2001-2009)
R million
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: CBD: Cape Town
Offices: CBD: Durban
Offices: CBD: Johannesburg


Office Capital Values: Decentralised: Cape Town, Durban and Johannesburg (2001-2009)
R million
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: Decentralised: Cape Town
Offices: Decentralised: Durban
Offices: Decentralised: Johannesburg

7.5 Base Rental Yield Data

CBD Office Base Rental Yield (%)

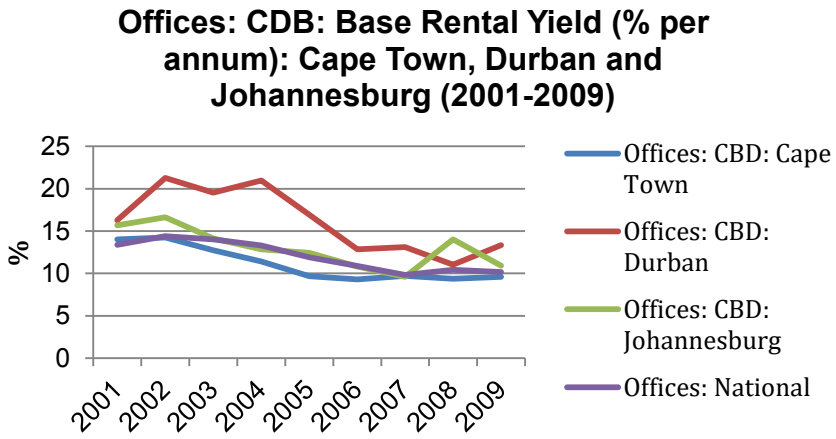
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	14,0	14,2	12,7	11,4	9,7	9,3	9,7	9,4	9,6
Durban	16,3	21,3	19,5	21,0	16,9	12,9	13,1	11,1	13,3
Johannesburg	15,7	16,6	14,1	12,9	12,4	10,8	9,6	14,0	10,9
National	13,4	14,4	14,0	13,3	11,9	10,9	9,8	10,4	10,2

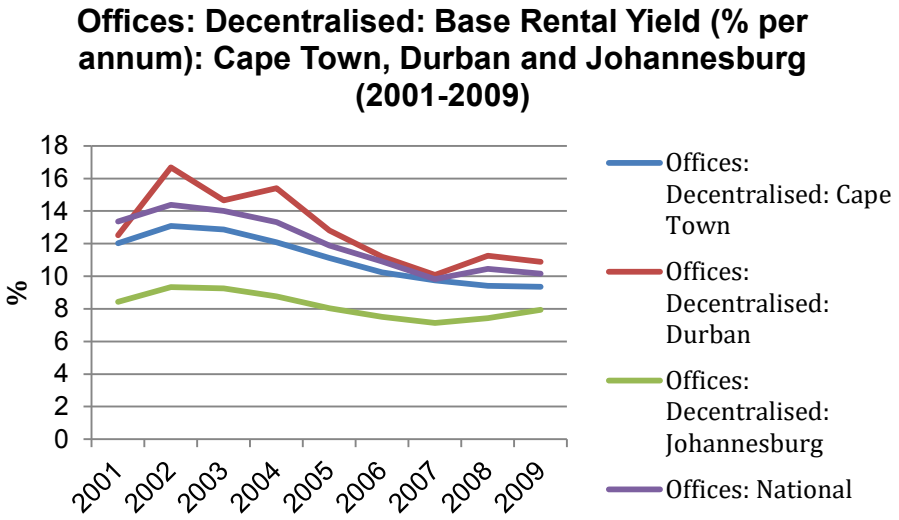
Source: Investment Property Databank (2013)

Decentralised Office Base Rental Yield (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	12,0	13,1	12,9	12,1	11,1	10,2	9,7	9,4	9,4
Durban	12,5	16,7	14,7	15,4	12,8	11,2	10,1	11,3	10,9
Johannesburg	8,4	9,3	9,2	8,8	8,0	7,5	7,1	7,4	7,9
National	13,4	14,4	14,0	13,3	11,9	10,9	9,8	10,4	10,2

Source: Investment Property Databank (2013)


Offices: CDB: Base Rental Yield (% per annum): Cape Town, Durban and Johannesburg (2001-2009)
%
25
20
15
10
5
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: CBD: Cape Town
Offices: CBD: Durban
Offices: CBD: Johannesburg
Offices: National


Offices: Decentralised: Base Rental Yield (% per annum): Cape Town, Durban and Johannesburg (2001-2009)
%
18
16
14
12
10
8
6
4
2
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: Decentralised: Cape Town
Offices: Decentralised: Durban
Offices: Decentralised: Johannesburg
Offices: National

7.6 Base Rental Yield Growth Data

CBD Office Base Rental Yield Growth (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	3,7	-2,6	-3,0	4,2	16,0	10,7	19,1	7,7	6,5
Durban	-0,4	8,3	-4,0	6,5	-5,4	6,0	14,5	11,9	13,3
Johannesburg	0,1	-9,8	4,2	6,2	6,1	9,4	11,3	73,1	-4,0
National	2,2	1,6	-0,7	2,6	5,4	7,0	14,0	15,6	7,3

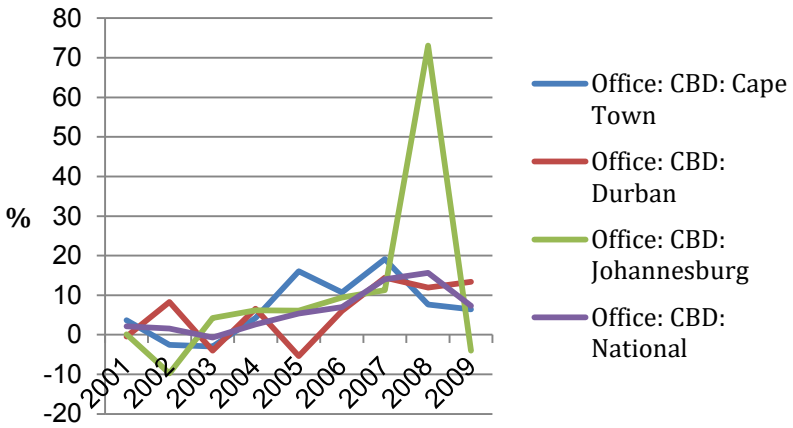
Source: Investment Property Databank (2013)

Decentralised Office Base Rental Yield Growth (%)

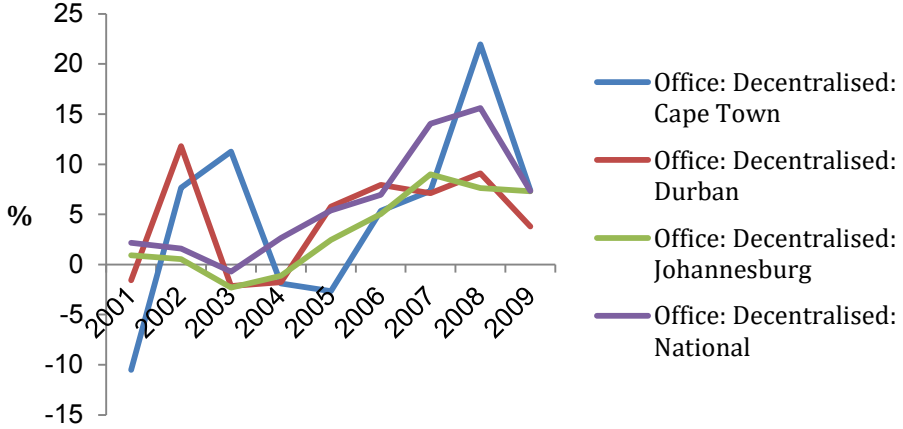
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	-10,5	7,7	11,3	-1,9	-2,6	5,4	7,3	22,0	7,4
Durban	-1,6	11,8	-2,2	-1,7	5,8	7,9	7,1	9,1	3,8
Johannesburg	0,9	0,5	-2,3	-1,1	2,4	5,1	9,0	7,6	7,3
National	2,2	1,6	-0,7	2,6	5,4	7,0	14,0	15,6	7,3

Source: Investment Property Databank (2013)

Offices: CBD: Base Rental Growth (%pa) Cape Town, Durban and Johannesburg (2001-2009)



Offices: Decentralised: Base Rental Growth (%pa) Cape Town, Durban and Johannesburg (2001-2009)



7.7 Income Return Data

CBD Office Income Return (%)

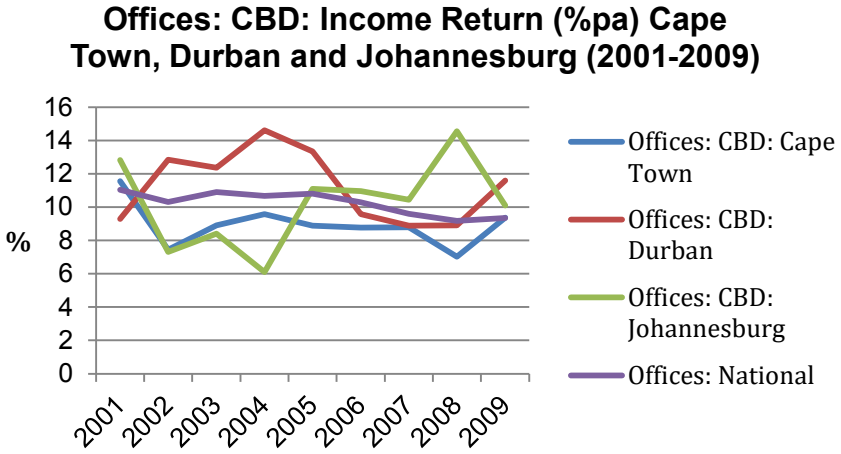
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	11,6	7,4	8,9	9,6	8,9	8,8	8,8	7,0	9,4
Durban	9,3	12,8	12,4	14,6	13,3	9,6	8,9	8,9	11,6
Johannesburg	12,8	7,3	8,4	6,1	11,1	11,0	10,4	14,6	10,1
National	11,0	10,3	10,9	10,7	10,8	10,3	9,6	9,2	9,4

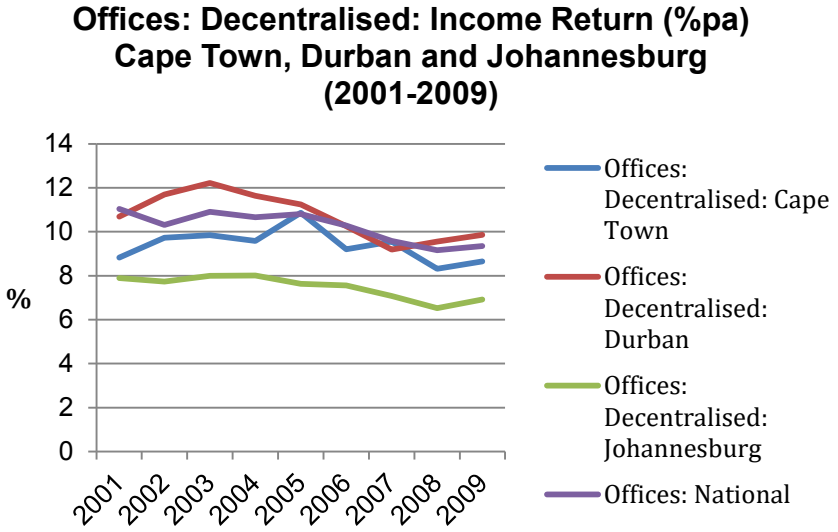
Source: Investment Property Databank (2013)

Decentralised Office Income Return (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	8,8	9,7	9,9	9,6	10,9	9,2	9,6	8,3	8,7
Durban	10,7	11,7	12,2	11,6	11,2	10,3	9,2	9,6	9,9
Johannesburg	7,9	7,7	8,0	8,0	7,6	7,6	7,1	6,5	6,9
National	11,0	10,3	10,9	10,7	10,8	10,3	9,6	9,2	9,4

Source: Investment Property Databank (2013)


Offices: CBD: Income Return (%pa) Cape Town, Durban and Johannesburg (2001-2009)
%
16
14
12
10
8
6
4
2
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: CBD: Cape Town
Offices: CBD: Durban
Offices: CBD: Johannesburg
Offices: National


Offices: Decentralised: Income Return (%pa) Cape Town, Durban and Johannesburg (2001-2009)
%
14
12
10
8
6
4
2
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: Decentralised: Cape Town
Offices: Decentralised: Durban
Offices: Decentralised: Johannesburg
Offices: National

7.8 Total Return Data

CBD Office Total Return (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	9,7	6,5	7,1	21,2	31,8	24,3	27,6	9,4	7,6
Durban	-7,9	-9,1	13,5	12,0	23,3	25,8	54,8	12,0	11,9
Johannesburg	6,4	-2,7	12,8	6,1	16,1	25,3	24,4	26,1	10,7
National	7,7	5,1	8,9	16,5	25,1	25,2	30,5	13,7	8,3

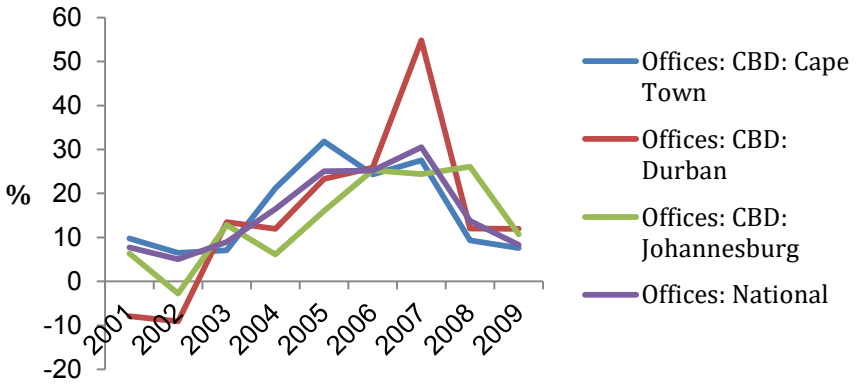
Source: Investment Property Databank (2013)

Decentralised Office Total Return (%)

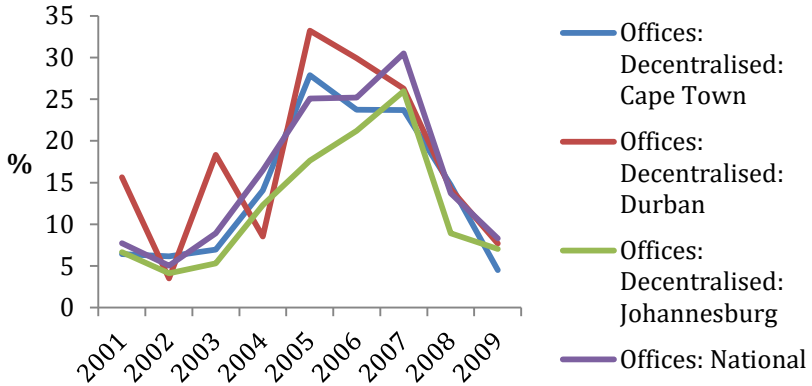
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	6,4	6,2	7,0	14,1	27,9	23,7	23,7	14,7	4,5
Durban	15,6	3,5	18,3	8,5	33,2	29,9	26,3	14,2	7,7
Johannesburg	6,6	4,1	5,3	12,3	17,6	21,2	26,0	8,9	7,0
National	7,7	5,1	8,9	16,5	25,1	25,2	30,5	13,7	8,3

Source: Investment Property Databank (2013)

Offices: CBD: Total Return (%pa) Cape Town, Durban and Johanesburg (2001-2009)



Offices: Decentralised: Total Return (%pa) Cape Town, Durban and Johanesburg (2001-2009)



7.9 Number of Office Investments

CBD Number of Office Investments

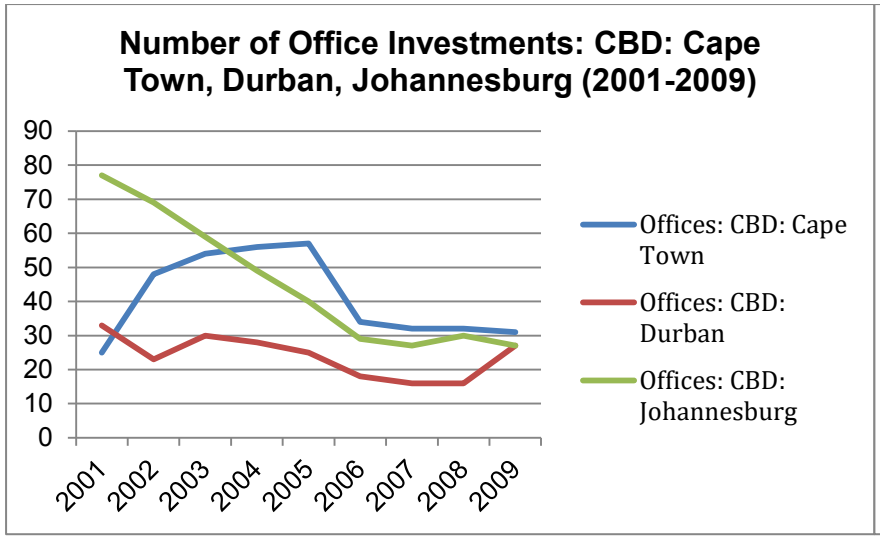
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	25	48	54	56	57	34	32	32	31
Durban	33	23	30	28	25	18	16	16	27
Johannesburg	77	69	59	49	40	29	27	30	27
National	664	621	901	940	863	774	691	697	722

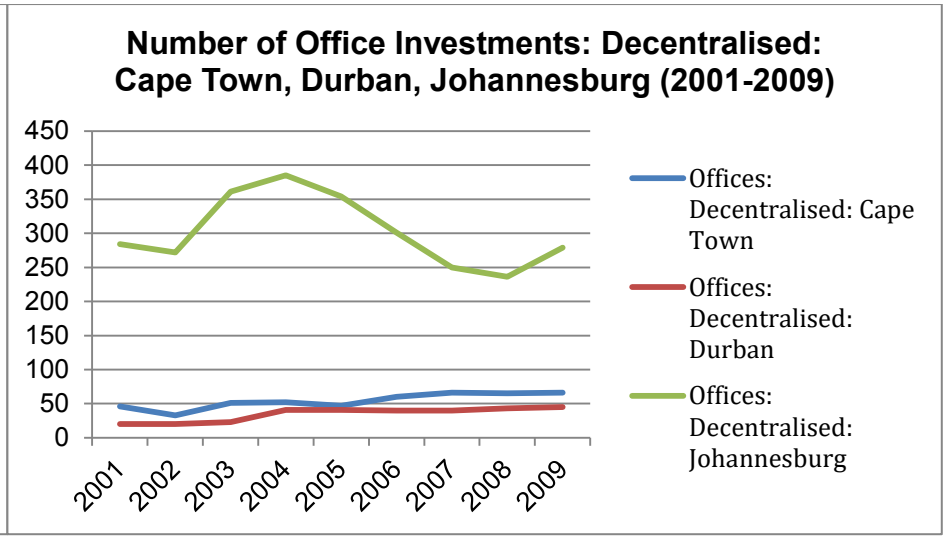
Source: Investment Property Databank (2013)

Decentralised Number of Office Investments

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cape Town	46	51	51	52	47	60	66	65	66
Durban	20	23	23	41	41	40	40	43	45
Johannesburg	284	361	361	385	354	301	250	236	279
National	664	621	901	940	863	774	691	697	722

Source: Investment Property Databank (2013)


Number of Office Investments: CBD: Cape Town, Durban, Johannesburg (2001-2009)
90
80
70
60
50
40
30
20
10
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: CBD: Cape Town
Offices: CBD: Durban
Offices: CBD: Johannesburg


Number of Office Investments: Decentralised: Cape Town, Durban, Johannesburg (2001-2009)
450
400
350
300
250
200
150
100
50
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
Offices: Decentralised: Cape Town
Offices: Decentralised: Durban
Offices: Decentralised: Johannesburg

7.10 National Gross Domestic Product Growth (2001-2009)

National Gross Domestic Product Growth (2001-2009):									
Year	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Brazil	1.3%	2.7%	1.1%	5.7%	3.2%	4.0%	6.1%	5.2%	-0.3%
China	8.3%	9.1%	10.0%	10.1%	11.3%	12.7%	14.2%	9.6%	9.2%
India	4.9%	3.9%	7.9%	7.8%	9.3%	9.3%	9.8%	3.9%	8.5%
Russia	5.1%	4.7%	7.3%	7.2%	6.4%	8.2%	8.5%	5.2%	-7.8%
South Africa	**2.7%**	**3.7%**	**2.9%**	**4.6%**	**5.3%**	**5.6%**	**5.5%**	**3.6%**	**-1.5%**
United States	1.1%	1.8%	2.6%	3.5%	3.1%	2.7%	1.9%	-0.4%	-3.5%

Source: The World Bank (2013)

7.11 Inflation

Inflation consumer prices (annual %)									
Year	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Brazil	6.8	8.5	14.7	6.6	6.9	4.2	3.6	5.7	4.9
China	0.7	-0.8	1.2	3.9	1.8	1.5	4.8	5.9	-0.7
India	3.7	4.4	3.8	3.8	4.2	6.1	6.4	8.4	10.9
Russia	21.5	15.8	13.7	10.9	12.7	9.7	9.0	14.1	11.7
South Africa	**5.7**	**9.2**	**5.9**	**1.4**	**3.4**	**4.6**	**7.1**	**11.5**	**7.1**
United States	2.8	1.6	2.3	2.7	3.4	3.2	2.9	3.8	-0.4

Source: The World Bank (2013)

7.12 Prime Lending Rate

Dates of Change in Prime Lending Rate (2001-2009)	
Date	**Value**
2009-08-14	10.50
2009-05-29	11.00
2009-05-04	12.00
2009-02-06	14.00
2008-12-12	15.00
2008-06-13	15.50
2008-04-11	15.00
2007-12-07	14.50
2007-10-12	14.00
2007-08-17	13.50
2007-06-08	13.00
2006-12-08	12.50
2006-10-13	12.00
2006-08-03	11.50
2006-06-08	11.00
2005-04-15	10.50

2004-08-16	11.00
2003-12-15	11.50
2003-10-20	12.00
2003-10-18	13.50
2003-09-10	14.50
2003-08-14	15.50
2003-06-10	17.00
2002-09-12	16.00
2002-06-13	15.00
2002-03-15	14.00
2002-01-15	13.00
2001-09-25	13.00
2001-07-16	13.50
2001-06-18	13.75

Source: South African Reserve Bank (2014)

7.13 Correlation Matrix

	Offices CBD: CPT	Offices CBD: DBN	Offices CBD: JHB	Offices Decentralised CPT	Offices Decentralised DBN	Offices Decentralised JHB
Offices CBD: CPT	1	0,71755	0,461481	0,937452	0,77689	0,898541
Offices CBD: DBN	0,71755	1	0,74228	0,738013	0,668549	0,887082
Offices CBD: JHB	0,461481	0,690967	1	0,666004	0,690967	0,675004
Offices Decentralised CPT	0,937452	0,738013	0,666004	1	0,849842	0,89646
Offices Decentralised DBN	0,77689	0,668549	0,690967	0,849842	1	0,769731
Offices Decentralised JHB	0,898541	0,887082	0,675004	0,89646	0,769731	1

7.14 Risk Return Relationships of Portfolio Combinations

Equally Invested

	2001	6,145706361
	2002	1,413844205
	2003	10,66756201
	2004	12,35876515
	2005	24,99008598
	2006	25,05222733
	2007	30,46412428
	2008	14,21258386
	2009	8,237458065
Standard Devation of Equally Invested		9,27860403
Mean		14,83803969
Risk Portfolio		0,625325462

Source: Investment Property Databank (2013)

	100% CPT CBD 0% DBN DEC	90% CPT CBD 10% DBN DEC	80% CPT CBD 20% DBN DEC	70% CPT CBD 30% DBN DEC	60% CPT CBD 40% DBN DEC	50% CPT CBD 50% DBN DEC	40% CPT CBD 60% DBN DEC	30% CPT CBD 70% DBN DEC	20% CPT CBD 80% DBN DEC	10% CPT CBD 90% DBN DEC	0% CPT CBD 100% DBN DEC
2001	9,7477	10,3351	10,9224	11,5098	12,0972	12,6845	13,2719	13,8592	14,4466	15,0340	15,6213
2002	6,5213	6,2192	5,9171	5,6150	5,3128	5,0107	4,7086	4,4065	4,1043	3,8022	6,1575
2003	7,0554	8,1841	9,3127	10,4414	11,5701	12,6988	13,8274	14,9561	16,0848	17,2135	6,9702
2004	21,1934	19,9282	18,6631	17,3980	16,1329	14,8678	13,6027	12,3376	11,0725	9,8073	14,0528
2005	31,8064	31,9480	32,0896	32,2311	32,3727	32,5143	32,6559	32,7974	32,9390	33,0806	27,8841
2006	24,2887	24,8524	25,4160	25,9797	26,5434	27,1071	27,6708	28,2345	28,7982	29,3619	23,7406
2007	27,5567	27,4293	27,3018	27,1744	27,0469	26,9195	26,7920	26,6646	26,5371	26,4097	23,7010
2008	9,3546	9,8398	10,3249	10,8101	11,2953	11,7804	12,2656	12,7508	13,2359	13,7211	14,7053
2009	7,5680	7,5806	7,5932	7,6058	7,6184	7,6309	7,6435	7,6561	7,6687	7,6813	4,4913
Standard Deviation	9,4466	9,2847	9,1652	9,0900	9,0600	9,0758	9,1370	9,2428	9,3917	**9,5817**	7,9720
Mean	16,1214	16,2574	16,3934	16,5295	16,6655	16,8016	16,9376	17,0736	17,2097	**17,3457**	15,2582
Risk Profile	0,5860	0,5711	0,5591	0,5499	0,5436	0,5402	0,5395	0,5414	0,5457	**0,5524**	0,5225

Source: Investment Property Databank (2013)

	100% JHB CBD 0% CPT DEC	90% JHB CBD 10% CPT DEC	80% JHB CBD 20% CPT DEC	70% JHB CBD 30% CPT DEC	60% JHB CBD 40% CPT DEC	50% JHB CBD 50% CPT DEC	40% JHB CBD 60% CPT DEC	30% JHB CBD 70% CPT DEC	20% JHB CBD 80% CPT DEC	10% JHB CBD 90% CPT DEC	0% JHB CBD 100% CPT DEC
2001	6,3586	6,3632	6,3678	6,3724	6,3769	6,3815	6,3861	6,3907	6,3953	6,3998	6,4044
2002	-2,7447	-1,8545	-0,9643	-0,0740	0,8162	1,7064	2,5966	3,4868	4,3771	5,2673	6,1575
2003	12,8298	12,2438	11,6579	11,0719	10,4860	9,9000	9,3141	8,7281	8,1421	7,5562	6,9702
2004	6,0954	6,8911	7,6868	8,4826	9,2783	10,0741	10,8698	11,6655	12,4613	13,2570	14,0528
2005	16,0505	17,2338	18,4172	19,6006	20,7839	21,9673	23,1506	24,3340	25,5173	26,7007	27,8841
2006	25,2976	25,1419	24,9862	24,8305	24,6748	24,5191	24,3634	24,2077	24,0520	23,8963	23,7406
2007	24,4198	24,3479	24,2761	24,2042	24,1323	24,0604	23,9885	23,9167	23,8448	23,7729	23,7010
2008	26,0950	24,9561	23,8171	22,6781	21,5391	20,4002	19,2612	18,1222	16,9833	15,8443	14,7053
2009	10,6999	10,0791	9,4582	8,8373	8,2165	7,5956	6,9748	6,3539	5,7330	5,1122	4,4913
Standard Deviation	9,4289	9,0698	8,7580	8,4986	8,2965	8,1559	8,0802	8,0712	8,1289	8,2522	8,4380
Mean	13,9002	13,9336	13,9670	14,0004	14,0338	14,0672	14,1006	14,1340	14,1674	14,2007	14,2341
Risk Profile	0,6783	0,6509	0,6270	0,6070	0,5912	0,5798	0,5730	0,5710	0,5738	0,5811	0,5928

Source: Investment Property Databank (2013)

	100% DBN CBD 0% JHB DEC	90% DBN CBD 10% JHB DEC	80% DBN CBD 20% JHB DEC	70% DBN CBD 30% JHB DEC	60% DBN CBD 40% JHB DEC	50% DBN CBD 50% JHB DEC	40% DBN CBD 60% JHB DEC	30% DBN CBD 70% JHB DEC	20% DBN CBD 80% JHB DEC	10% DBN CBD 90% JHB DEC	0% DBN CBD 100% JHB DEC
2001	-7,9004	-6,4468	-4,9933	-3,5397	-2,0862	-0,6326	0,8209	2,2745	3,7280	5,1816	6,6351
2002	-9,0540	-7,7385	-6,4230	-5,1075	-3,7919	-2,4764	-1,1609	0,1546	1,4701	2,7856	4,1011
2003	13,4846	12,6671	11,8497	11,0323	10,2149	9,3975	8,5801	7,7627	6,9453	6,1279	5,3105
2004	11,9789	12,0086	12,0382	12,0678	12,0974	12,1270	12,1567	12,1863	12,2159	12,2455	12,2751
2005	23,3033	22,7374	22,1715	21,6055	21,0396	20,4737	19,9078	19,3419	18,7760	18,2100	17,6441
2006	25,8383	25,3737	24,9092	24,4446	23,9800	23,5155	23,0509	22,5863	22,1218	21,6572	21,1926
2007	54,8147	51,9306	49,0465	46,1624	43,2783	40,3942	37,5101	34,6260	31,7419	28,8578	25,9737
2008	11,9863	11,6788	11,3712	11,0637	10,7562	10,4486	10,1411	9,8335	9,5260	9,2185	8,9109
2009	11,9424	11,4501	10,9578	10,4655	9,9732	9,4809	8,9886	8,4963	8,0040	7,5117	7,0194
Standard Deviation	17,9638	16,8199	15,6838	14,5572	13,4427	12,3434	11,2638	10,2102	9,1915	8,2208	7,3170
Mean	15,1549	14,8512	14,5475	14,2439	13,9402	13,6365	13,3328	13,0291	12,7254	12,4218	12,1181
Risk Profile	1,1853	1,1326	1,0781	1,0220	0,9643	0,9052	0,8448	0,7836	0,7223	0,6618	0,6038

Source: Investment Property Databank (2013)

	100% CPT CBD 0% DBN CBD	90% CPT CBD 10% DBN CBD	80% CPT CBD 20% DBN CBD	70% CPT CBD 30% DBN CBD	60% CPT CBD 40% DBN CBD	50% CPT CBD 50% DBN CBD	40% CPT CBD 60% DBN CBD	30% CPT CBD 70% DBN CBD	20% CPT CBD 80% DBN CBD	10% CPT CBD 90% DBN CBD	0% CPT CBD 100% DBN CBD
2001	9,7477	7,9829	6,2181	4,4533	2,6885	0,9237	-0,8411	-2,6059	-4,3707	7,9829	-7,9004
2002	6,5213	4,9638	3,4063	1,8487	0,2912	-1,2663	-2,8239	-4,3814	-5,9389	4,9638	-9,0540
2003	7,0554	7,6983	8,3412	8,9841	9,6271	10,2700	10,9129	11,5558	12,1987	7,6983	13,4846
2004	21,1934	20,2719	19,3505	18,4290	17,5076	16,5861	15,6647	14,7433	13,8218	20,2719	11,9789
2005	31,8064	30,9561	30,1058	29,2555	28,4052	27,5549	26,7045	25,8542	25,0039	30,9561	23,3033
2006	24,2887	24,4436	24,5986	24,7536	24,9085	25,0635	25,2184	25,3734	25,5284	24,4436	25,8383
2007	27,5567	30,2825	33,0083	35,7341	38,4599	41,1857	43,9115	46,6373	49,3631	30,2825	54,8147
2008	9,3546	9,6178	9,8810	10,1441	10,4073	10,6705	10,9336	11,1968	11,4600	9,6178	11,9863
2009	7,5680	8,0055	8,4429	8,8803	9,3178	9,7552	10,1926	10,6301	11,0675	8,0055	11,9424
Standard Deviation	9,4466	9,8705	10,4396	11,1315	11,9250	12,8011	13,7440	14,7409	15,7817	9,8705	17,9638
Mean	16,1214	16,0247	15,9281	15,8314	15,7348	15,6381	15,5415	15,4448	15,3482	16,0247	15,1549
Risk Profile	0,5860	0,6160	0,6554	0,7031	0,7579	0,8186	0,8843	0,9544	1,0282	0,6160	1,1853

Source: Investment Property Databank (2013)

	100% JHB CBD 0% DBN CBD	90% JHB CBD 10% DBN CBD	80% JHB CBD 20% DBN CBD	70% JHB CBD 30% DBN CBD	60% JHB CBD 40% DBN CBD	50% JHB CBD 50% DBN CBD	40% JHB CBD 60% DBN CBD	30% JHB CBD 70% DBN CBD	20% JHB CBD 80% DBN CBD	10% JHB CBD 90% DBN CBD	0% JHB CBD 100% DBN CBD
2001	6,3586	4,9327	3,5068	2,0809	0,6550	-0,7709	-2,1968	-3,6227	-5,0486	-6,4745	-7,9004
2002	-2,7447	-3,3756	-4,0066	-4,6375	-5,2684	-5,8994	-6,5303	-7,1612	-7,7921	-8,4231	-9,0540
2003	12,8298	12,8953	12,9608	13,0262	13,0917	13,1572	13,2227	13,2881	13,3536	13,4191	13,4846
2004	6,0954	6,6837	7,2721	7,8604	8,4488	9,0372	9,6255	10,2139	10,8022	11,3906	11,9789
2005	16,0505	16,7758	17,5011	18,2263	18,9516	19,6769	20,4022	21,1275	21,8527	22,5780	23,3033
2006	25,2976	25,3516	25,4057	25,4598	25,5138	25,5679	25,6220	25,6761	25,7301	25,7842	25,8383
2007	24,4198	27,4593	30,4988	33,5383	36,5778	39,6173	42,6567	45,6962	48,7357	51,7752	54,8147
2008	26,0950	24,6841	23,2733	21,8624	20,4515	19,0407	17,6298	16,2189	14,8081	13,3972	11,9863
2009	10,6999	10,8242	10,9484	11,0727	11,1969	11,3212	11,4454	11,5697	11,6939	11,8181	11,9424
Standard Deviation	9,4289	9,8929	10,4899	11,1987	11,9994	12,8749	13,8110	14,7962	15,8214	16,8791	17,9638
Mean	13,9002	14,0257	14,1511	14,2766	14,4021	14,5276	14,6530	14,7785	14,9040	15,0294	15,1549
Risk Profile	0,6783	0,7053	0,7413	0,7844	0,8332	0,8862	0,9425	1,0012	1,0616	1,1231	1,1853

Source: Investment Property Databank (2013)

	100% JHB CBD 0% CPT CBD	90% JHB CBD 10% CPT CBD	80% JHB CBD 20% CPT CBD	70% JHB CBD 30% CPT CBD	60% JHB CBD 40% CPT CBD	50% JHB CBD 50% CPT CBD	40% JHB CBD 60% CPT CBD	30% JHB CBD 70% CPT CBD	20% JHB CBD 80% CPT CBD	10% JHB CBD 90% CPT CBD	0% JHB CBD 100% CPT CBD
2001	6,3586	6,6975	7,0364	7,3754	7,7143	8,0532	8,3921	8,7310	9,0699	9,4088	9,7477
2002	-2,7447	-1,8181	-0,8915	0,0351	0,9617	1,8883	2,8149	3,7415	4,6681	5,5947	6,5213
2003	12,8298	12,2524	11,6749	11,0975	10,5200	9,9426	9,3652	8,7877	8,2103	7,6328	7,0554
2004	6,0954	7,6052	9,1150	10,6248	12,1346	13,6444	15,1542	16,6640	18,1738	19,6836	21,1934
2005	16,0505	17,6261	19,2017	20,7773	22,3529	23,9285	25,5040	27,0796	28,6552	30,2308	31,8064
2006	25,2976	25,1967	25,0958	24,9949	24,8940	24,7931	24,6922	24,5913	24,4904	24,3896	24,2887
2007	24,4198	24,7335	25,0472	25,3609	25,6746	25,9883	26,3020	26,6156	26,9293	27,2430	27,5567
2008	26,0950	24,4210	22,7469	21,0729	19,3989	17,7248	16,0508	14,3767	12,7027	11,0287	9,3546
2009	10,6999	10,3867	10,0736	9,7604	9,4472	9,1340	8,8208	8,5076	8,1944	7,8812	7,5680
Standard Deviation	9,4289	8,9612	8,5803	8,2981	8,1249	8,0677	8,1290	8,3061	8,5920	8,9761	9,4466
Mean	13,9002	14,1223	14,3444	14,5666	14,7887	15,0108	15,2329	15,4550	15,6771	15,8992	16,1214
Risk Profile	0,6783	0,6345	0,5982	0,5697	0,5494	0,5375	0,5336	0,5374	0,5481	0,5646	0,5860

Source: Investment Property Databank (2013)

	100% JHB DEC 0% DBN DEC	90% JHB DEC 10% DBN DEC	80% JHB DEC 20% DBN DEC	70% JHB DEC 30% DBN DEC	60% JHB DEC 40% DBN DEC	50% JHB DEC 50% DBN DEC	40% JHB DEC 60% DBN DEC	30% JHB DEC 70% DBN DEC	20% JHB DEC 80% DBN DEC	10% JHB DEC 90% DBN DEC	0% JHB DEC 100% DBN DEC
2001	6,6351	7,5338	8,4324	9,3310	10,2296	11,1282	12,0268	12,9255	13,8241	14,7227	15,6213
2002	4,1011	4,0410	3,9809	3,9208	3,8607	3,8006	3,7405	3,6804	3,6203	3,5602	3,5001
2003	5,3105	6,6137	7,9168	9,2200	10,5231	11,8263	13,1295	14,4326	15,7358	17,0390	18,3421
2004	12,2751	11,9018	11,5286	11,1553	10,7820	10,4087	10,0354	9,6621	9,2888	8,9155	8,5422
2005	17,6441	19,2019	20,7597	22,3175	23,8753	25,4331	26,9909	28,5487	30,1065	31,6643	33,2221
2006	21,1926	22,0659	22,9392	23,8125	24,6858	25,5591	26,4324	27,3057	28,1790	29,0522	29,9255
2007	25,9737	26,0046	26,0354	26,0663	26,0971	26,1280	26,1588	26,1897	26,2205	26,2514	26,2822
2008	8,9109	9,4405	9,9700	10,4995	11,0291	11,5586	12,0881	12,6177	13,1472	13,6767	14,2063
2009	7,0194	7,0868	7,1543	7,2217	7,2892	7,3566	7,4241	7,4915	7,5589	7,6264	7,6938
Standard Deviation	7,3170	7,3671	7,4696	7,6225	7,8227	8,0667	8,3508	8,6709	9,0232	9,4042	9,8104
Mean	12,1181	12,6544	13,1908	13,7272	14,2635	14,7999	15,3363	15,8726	16,4090	16,9454	17,4818
Risk Profile	0,6038	0,5822	0,5663	0,5553	0,5484	0,5451	0,5445	0,5463	0,5499	0,5550	0,5612

Source: Investment Property Databank (2013)

	100% CPT DEC 0% JHB CBD	90% CPT DEC 10% JHB CBD	80% CPT DEC 20% JHB CBD	70% CPT DEC 30% JHB CBD	60% CPT DEC 40% JHB CBD	50% CPT DEC 50% JHB CBD	40% CPT DEC 60% JHB CBD	30% CPT DEC 70% JHB CBD	20% CPT DEC 80% JHB CBD	10% CPT DEC 90% JHB CBD	0% CPT DEC 100% JHB CBD
2001	6,4044	6,3998	6,3953	6,3907	6,3861	6,3815	6,3769	6,3724	6,3678	6,3632	6,3586
2002	6,1575	5,2673	3,0047	3,4868	2,5966	1,7064	0,8162	-0,0740	-0,9643	-1,8545	-2,7447
2003	6,9702	7,5562	14,5570	8,7281	9,3141	9,9000	10,4860	11,0719	11,6579	12,2438	12,8298
2004	14,0528	13,2570	15,5090	11,6655	10,8698	10,0741	9,2783	8,4826	7,6868	6,8911	6,0954
2005	27,8841	26,7007	33,5426	24,3340	23,1506	21,9673	20,7839	19,6006	18,4172	17,2338	16,0505
2006	23,7406	23,8963	36,7008	24,2077	24,3634	24,5191	24,6748	24,8305	24,9862	25,1419	25,2976
2007	23,7010	23,7729	36,0547	23,9167	23,9885	24,0604	24,1323	24,2042	24,2761	24,3479	24,4198
2008	14,7053	15,8443	30,0308	18,1222	19,2612	20,4002	21,5391	22,6781	23,8171	24,9561	26,0950
2009	4,4913	5,1122	11,0830	6,3539	6,9748	7,5956	8,2165	8,8373	9,4582	10,0791	10,6999
Standard Deviation	8,4380	8,2522	12,5551	8,0712	8,0802	8,1559	8,2965	8,4986	8,7580	9,0698	9,4289
Mean	14,2341	14,2007	20,7642	14,1340	14,1006	14,0672	14,0338	14,0004	13,9670	13,9336	13,9002
Risk Profile	0,5928	0,5811	0,6047	0,5710	0,5730	0,5798	0,5912	0,6070	0,6270	0,6509	0,6783

Source: Investment Property Databank (2013)

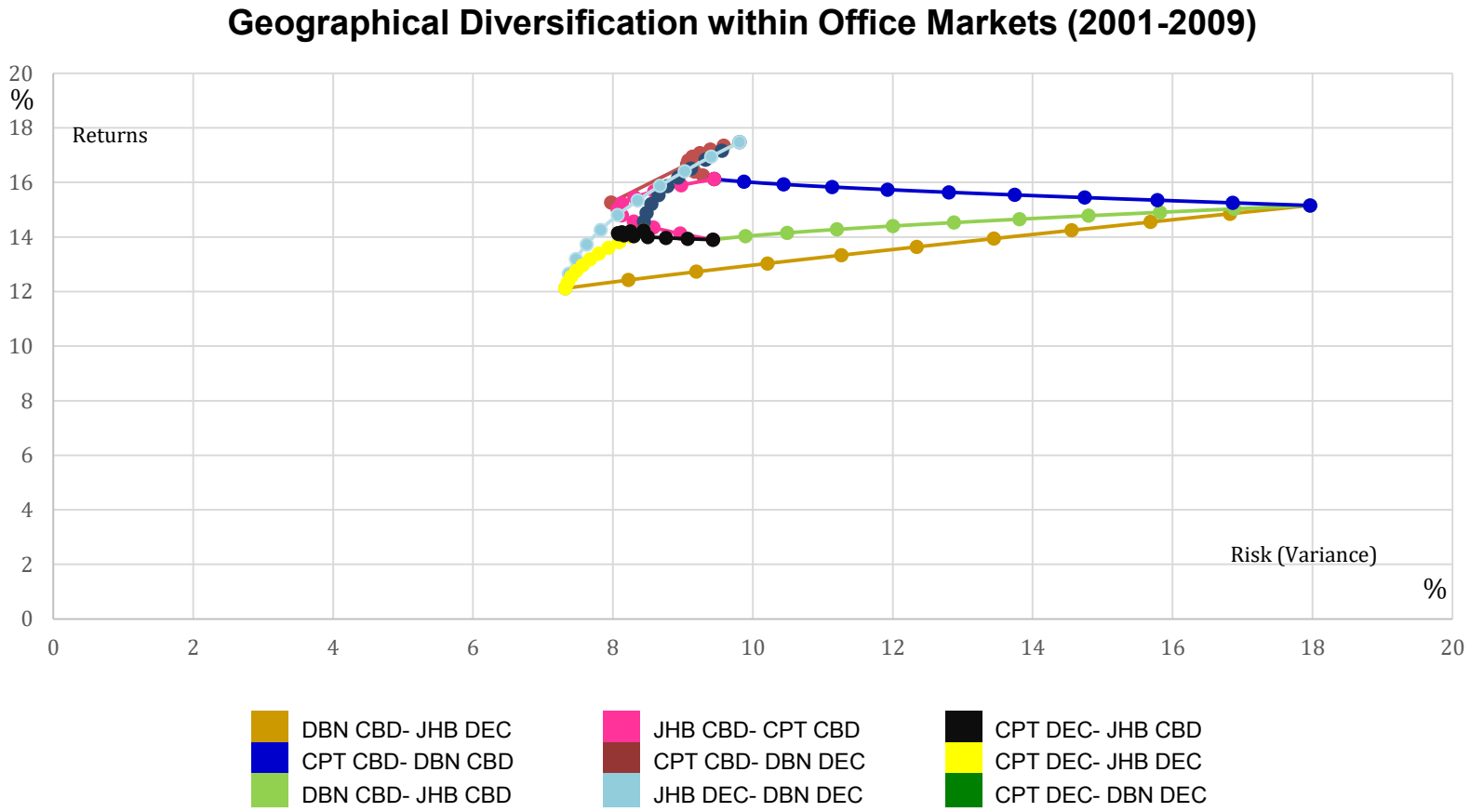
	100% CPT DEC 0% JHB DEC	90% CPT DEC 10% JHB DEC	80% CPT DEC 20% JHB DEC	70% CPT DEC 30% JHB DEC	60% CPT DEC 40% JHB DEC	50% CPT DEC 50% JHB DEC	40% CPT DEC 60% JHB DEC	30% CPT DEC 70% JHB DEC	20% CPT DEC 80% JHB DEC	10% CPT DEC 90% JHB DEC	0% CPT DEC 100% JHB DEC
2001	6,4044	6,4275	6,4506	6,4736	6,4967	6,5198	6,5429	6,5659	6,5890	6,6121	6,6351
2002	6,1575	5,9519	5,7462	5,5406	5,3350	5,1293	4,9237	4,7180	4,5124	4,3068	4,1011
2003	6,9702	6,8042	6,6383	6,4723	6,3063	6,1404	5,9744	5,8084	5,6424	5,4765	5,3105
2004	14,0528	13,8750	13,6972	13,5195	13,3417	13,1639	12,9862	12,8084	12,6307	12,4529	12,2751
2005	27,8841	26,8601	25,8361	24,8121	23,7881	22,7641	21,7401	20,7161	19,6921	18,6681	17,6441
2006	23,7406	23,4858	23,2310	22,9762	22,7214	22,4666	22,2118	21,9570	21,7022	21,4474	21,1926
2007	23,7010	23,9283	24,1556	24,3829	24,6101	24,8374	25,0647	25,2919	25,5192	25,7465	25,9737
2008	14,7053	14,1259	13,5464	12,9670	12,3876	11,8081	11,2287	10,6493	10,0698	9,4904	8,9109
2009	4,4913	4,7441	4,9969	5,2497	5,5025	5,7553	6,0081	6,2610	6,5138	6,7666	7,0194
Standard Deviation	8,4380	8,2565	8,0883	7,9343	7,7952	7,6719	7,5652	7,4758	7,4043	7,3513	7,3170
Mean	14,2341	14,0225	13,8109	13,5993	13,3877	13,1761	12,9645	12,7529	12,5413	12,3297	12,1181
Risk Profile	0,5928	0,5888	0,5856	0,5834	0,5823	0,5823	0,5835	0,5862	0,5904	0,5962	0,6038

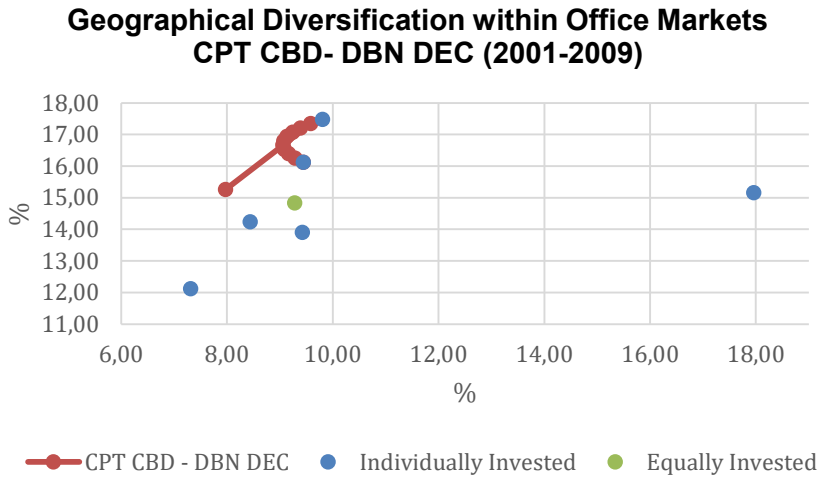
Source: Investment Property Databank (2013)

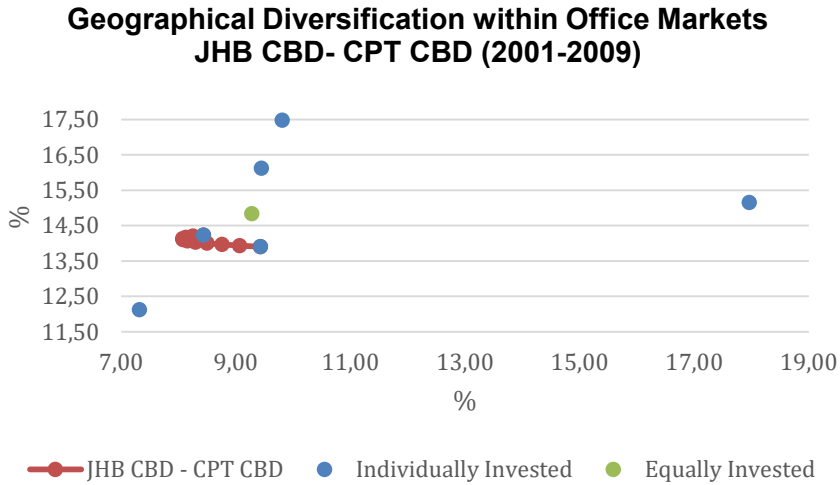
	100% CPT DEC 0% DBN DEC	90% CPT DEC 10% DBN DEC	80% CPT DEC 20% DBN DEC	70% CPT DEC 30% DBN DEC	60% CPT DEC 40% DBN DEC	50% CPT DEC 50% DBN DEC	40% CPT DEC 60% DBN DEC	30% CPT DEC 70% DBN DEC	20% CPT DEC 80% DBN DEC	10% CPT DEC 90% DBN DEC	0% CPT DEC 100% DBN DEC
2001	6,4044	7,3261	8,2478	9,1695	10,0912	11,0129	11,9346	12,8563	13,7779	14,6996	15,6213
2002	6,1575	5,8918	5,6260	5,3603	5,0945	4,8288	4,5631	4,2973	4,0316	3,7658	3,5001
2003	6,9702	8,1074	9,2446	10,3818	11,5190	12,6562	13,7934	14,9306	16,0677	17,2049	18,3421
2004	14,0528	13,5017	12,9506	12,3996	11,8485	11,2975	10,7464	10,1954	9,6443	9,0933	8,5422
2005	27,8841	28,4179	28,9517	29,4855	30,0193	30,5531	31,0869	31,6207	32,1545	32,6883	33,2221
2006	23,7406	24,3591	24,9776	25,5961	26,2146	26,8331	27,4516	28,0701	28,6886	29,3070	29,9255
2007	23,7010	23,9592	24,2173	24,4754	24,7335	24,9916	25,2497	25,5079	25,7660	26,0241	26,2822
2008	14,7053	14,6554	14,6055	14,5556	14,5057	14,4558	14,4059	14,3560	14,3061	14,2562	14,2063
2009	4,4913	4,8116	5,1318	5,4521	5,7723	6,0926	6,4128	6,7331	7,0533	7,3736	7,6938
Standard Deviation	8,4380	8,4437	8,4811	8,5496	8,6486	8,7770	8,9335	9,1167	9,3250	9,5568	9,8104
Mean	14,2341	14,5589	14,8837	15,2084	15,5332	15,8579	16,1827	16,5075	16,8322	17,1570	17,4818
Risk Profile	0,5928	0,5800	0,5698	0,5622	0,5568	0,5535	0,5520	0,5523	0,5540	0,5570	0,5612

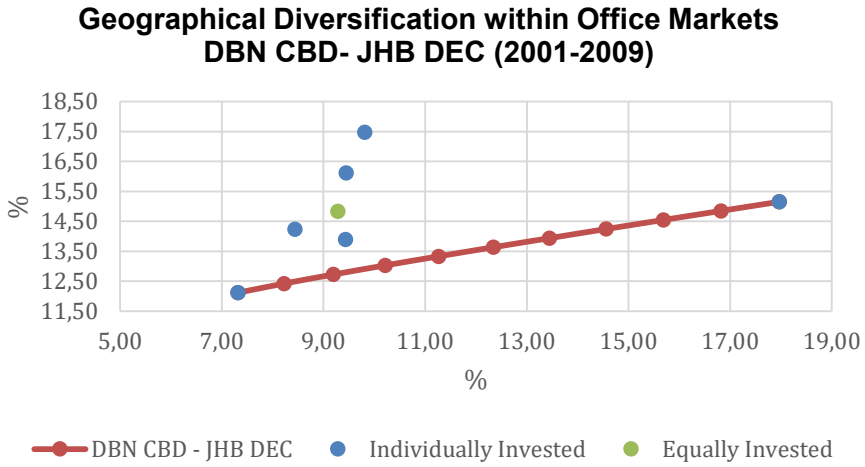
Source: Investment Property Databank (2013)

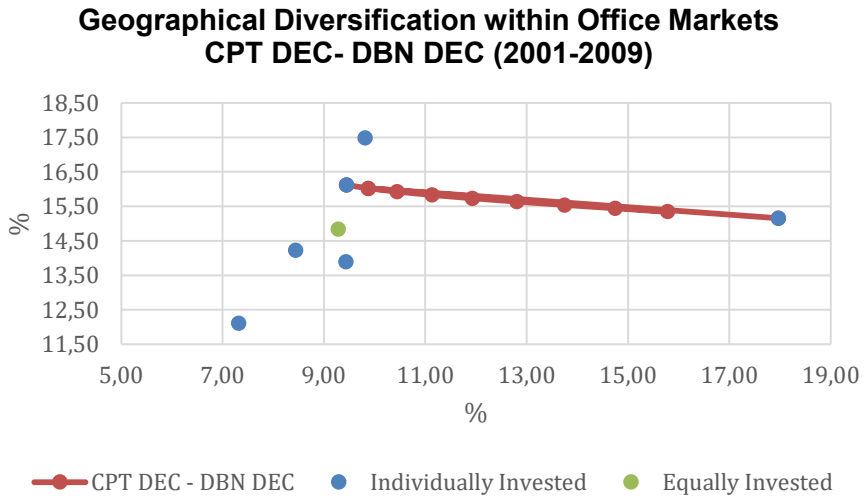
7.15 Geographical Diversification within Office Markets

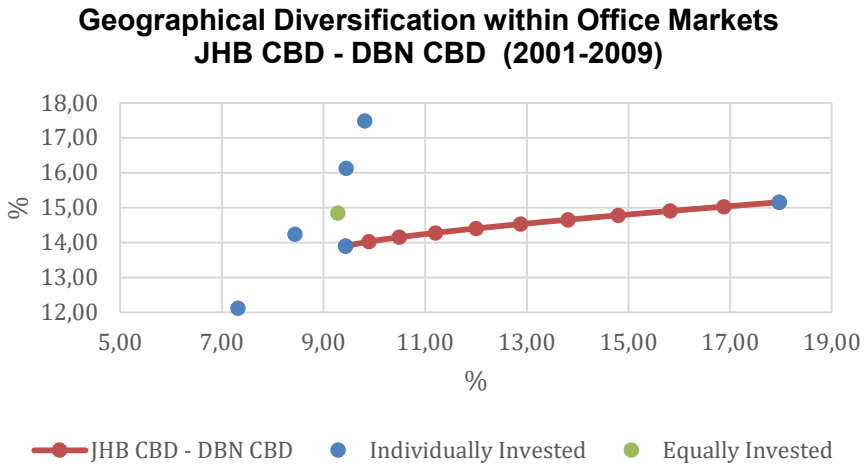


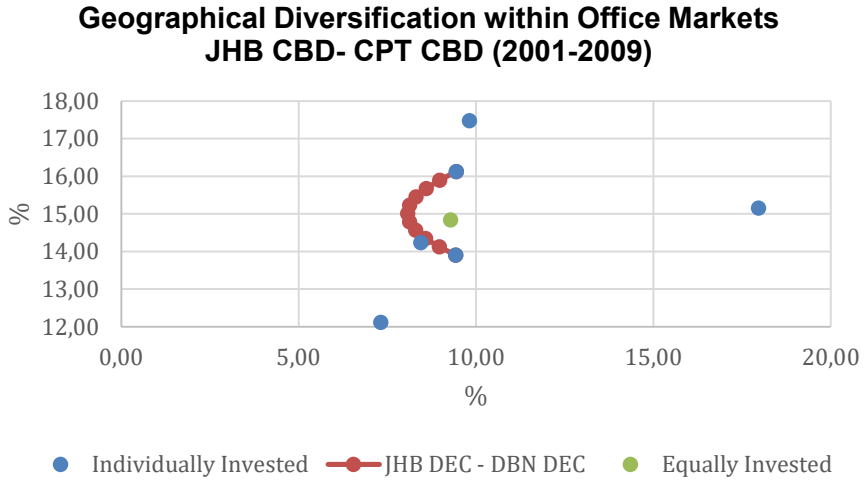

Geographical Diversification within Office Markets
CPT CBD- DBN DEC (2001-2009)
18,00
17,00
16,00
15,00
14,00
13,00
12,00
11,00
%
6,00
8,00
10,00
12,00
14,00
16,00
18,00
%
CPT CBD - DBN DEC
Individually Invested
Equally Invested

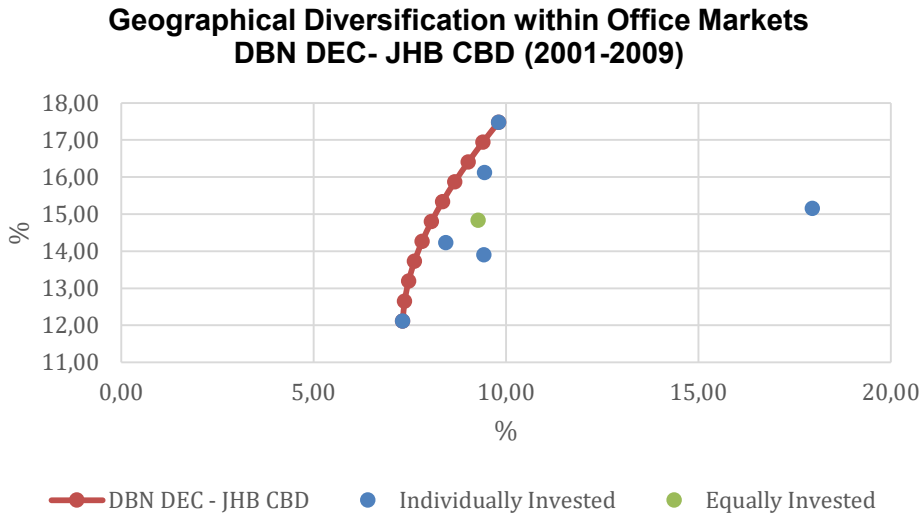

Geographical Diversification within Office Markets
JHB CBD- CPT CBD (2001-2009)
17,50
16,50
15,50
14,50
13,50
12,50
11,50
%
7,00
9,00
11,00
13,00
15,00
17,00
19,00
%
JHB CBD - CPT CBD
Individually Invested
Equally Invested

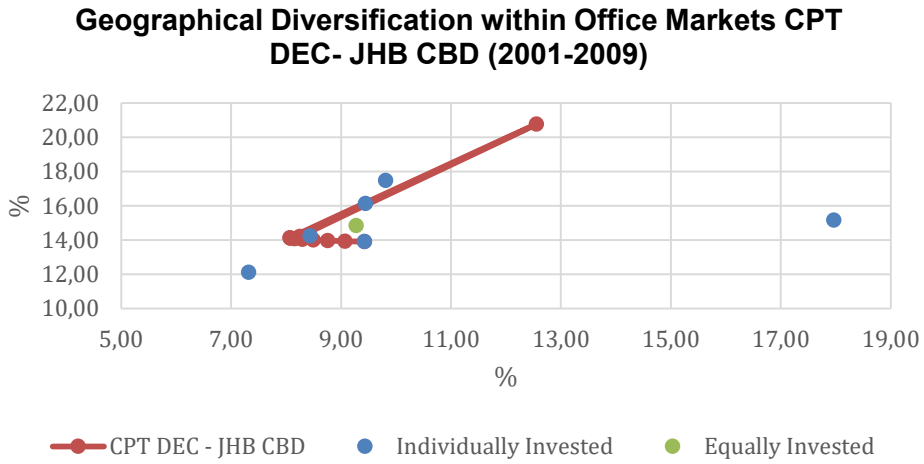

Geographical Diversification within Office Markets
DBN CBD- JHB DEC (2001-2009)
18,50
17,50
16,50
15,50
14,50
13,50
12,50
11,50
%
5,00
7,00
9,00
11,00
13,00
15,00
17,00
19,00
%
DBN CBD - JHB DEC
Individually Invested
Equally Invested

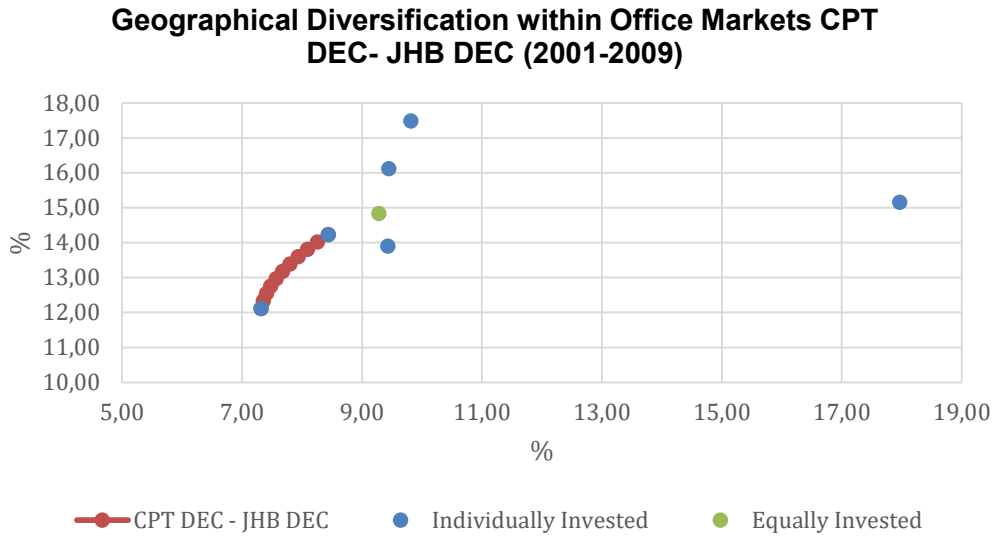

Geographical Diversification within Office Markets
CPT DEC- DBN DEC (2001-2009)
18,50
17,50
16,50
15,50
14,50
13,50
12,50
11,50
%
5,00
7,00
9,00
11,00
13,00
15,00
17,00
19,00
%
CPT DEC - DBN DEC
Individually Invested
Equally Invested

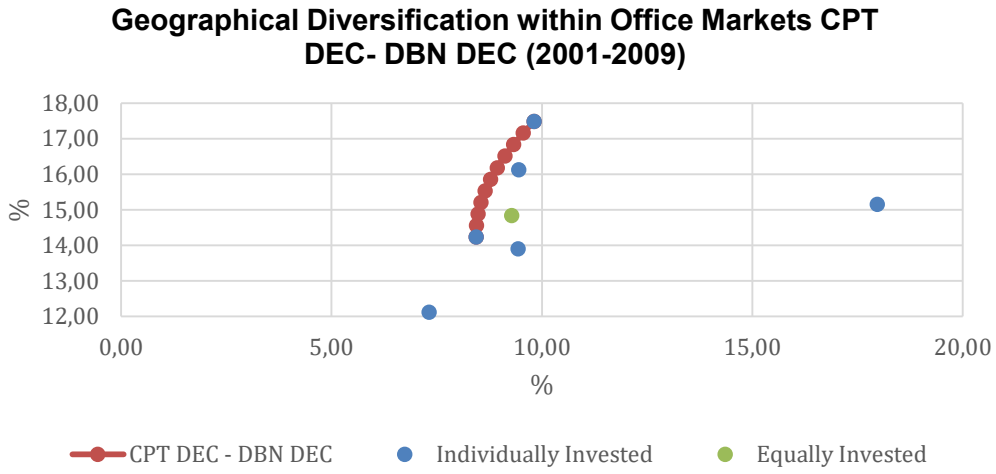

Geographical Diversification within Office Markets
JHB CBD - DBN CBD (2001-2009)
18,00
17,00
16,00
15,00
14,00
13,00
12,00
%
5,00
7,00
9,00
11,00
13,00
15,00
17,00
19,00
%
JHB CBD - DBN CBD
Individually Invested
Equally Invested


Geographical Diversification within Office Markets
JHB CBD- CPT CBD (2001-2009)
18,00
17,00
16,00
15,00
14,00
13,00
12,00
%
0,00
5,00
10,00
15,00
20,00
%
Individually Invested
JHB DEC - DBN DEC
Equally Invested


Geographical Diversification within Office Markets
DBN DEC- JHB CBD (2001-2009)
18,00
17,00
16,00
15,00
14,00
13,00
12,00
11,00
%
0,00
5,00
10,00
15,00
20,00
%
DBN DEC - JHB CBD
Individually Invested
Equally Invested


Geographical Diversification within Office Markets CPT
DEC- JHB CBD (2001-2009)
22,00
20,00
18,00
16,00
14,00
12,00
10,00
%
5,00
7,00
9,00
11,00
13,00
15,00
17,00
19,00
%
CPT DEC - JHB CBD
Individually Invested
Equally Invested


Geographical Diversification within Office Markets CPT DEC- JHB DEC (2001-2009)
18,00
17,00
16,00
15,00
14,00
13,00
12,00
11,00
10,00
%
5,00
7,00
9,00
11,00
13,00
15,00
17,00
19,00
%
CPT DEC - JHB DEC
Individually Invested
Equally Invested


Geographical Diversification within Office Markets CPT DEC- DBN DEC (2001-2009)
18,00
17,00
16,00
15,00
14,00
13,00
12,00
%
0,00
5,00
10,00
15,00
20,00
%
CPT DEC - DBN DEC
Individually Invested
Equally Invested